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ABSTRACT

Some course and curriculum improvement projects funded by the National Science Foundation have produced definitive editions of textbooks, other printed materials, and instructional films. This bulletin lists materials available in 1968 through commercial or college and university sources. The publications include textbooks, laboratory guides, teachers' guides, supplementary readings for students and teachers, and sourcebooks. Materials are grouped by educational level (elementary and secondary school; college and university), and, within each level, by discipline (multidisciplinary, earth sciences, biology, chemistry, mathematics, physics, engineering, and social sciences). Citations include the project title, grantee, project director (1968), publishers of books and films, and 1968 prices. (Author/AL)

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F-NSF

National Science Foundation
Washington, D. C. 20550

ED 054946

RELEASED TEXTBOOKS, FILMS AND OTHER TEACHING MATERIALS

PREPARED BY COURSE AND CURRICULUM IMPROVEMENT PROJECTS

SUPPORTED BY

THE NATIONAL SCIENCE FOUNDATION

SE 012 377

July 1968

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NSF 68-24

INTRODUCTION

One of the major responsibilities of the National Science Foundation, an independent agency of the Federal Government, is to support the improvement of the quality of education in the sciences in the Nation's educational institutions. In carrying out this responsibility, the Foundation has developed a broad and flexible series of programs to help meet the needs of students, faculties, instructional programs and institutions.

Within this framework, an important area of concern has been support for efforts by scientists and science educators, aided by experts in instructional media, to create models of curricula, courses, and materials designed to help students and teachers at all educational levels gain deeper and more realistic insights into mathematics, the physical, biological, environmental and social sciences, and engineering. In working toward this goal, over the past decade the Foundation has supported more than 400 curriculum and course content improvement projects, most of which are described in a booklet, Course and Curriculum Improvement Projects (NSF 66-22), available from the National Science Foundation, Washington, D. C. 20550. These projects have developed an extensive collection of instructional materials for all educational levels from kindergarten to graduate school.

Some projects have produced definitive editions of textbooks and other printed materials and instructional films and kinescopes, many of which are now available through commercial publishers or distributors and college and university film distribution units. The purpose of this listing is to provide an easy reference to these publications and films. The publications include textbooks, laboratory guides, teachers' guides, supplementary readings for students and teachers, and sourcebooks. Preliminary versions and special reports are not included. The list groups materials by educational level and, within level, by discipline. Citations for each project give the project title, grantee, current project director (with his present address where different from that of the grantee), and titles and publishers of books and films. The list of films is limited to those generally available through sale and rental by the distributors. Prices shown are subject to change.

It should be emphasized that inclusion of an item carries no implication of endorsement or approval by the Foundation or the Federal Government.

The Foundation also issues a list of translations and adaptations of the United States materials for use in other countries. This list is available from the Course Content Improvement Program, Pre-College Education in Science, or the Science Curriculum Improvement Program, Undergraduate Education in Science, National Science Foundation, Washington, D. C. 20550.

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I. GENERAL PROJECTS (ALL LEVELS)

1. STUDY ON FUNDAMENTAL PROCESSES IN EDUCATION. National Academy of Sciences-National Research Council, 2101 Constitution Ave., N.W., Washington, D. C. 20418; R. M. Whaley, Chancellor, University of Kansas.

   Harvard University Press, Cambridge, Mass. 02138:

   The Process of Education (Bruner) (1962), $2.75

2. HORIZONS OF SCIENCE FILMS. Educational Testing Service, Princeton, N. J. 08540; John S. Hollister.

   16mm, sound, color, 20 min.

   Visual Perception, with Hadley Cantril, Princeton University
   The Worlds of Dr. Vishniac, with Roman Vishniac, Yeshiva University
   Exploring the Edge of Space, with Otto C. Winzen
   'Thinking Machines', with Claude Shannon, Massachusetts Institute of Technology; Alex Bernstein, International Business Machines; and Leon Harmon, Bell Laboratories
   The Mathematician and the River, with Eugene Isaacson, New York University.
   New Lives for Old, with Margaret Mead, American Museum of Natural History
   Project 'Mohole'
   The Realm of the Galaxies, with Allan R. Sandage, Mt. Wilson and Palomar Observatories
   The Flow of Life, with Benjamin Zweifach, New York Medical Center, and others
   Neutrons and the Heart of Matter, with the late Donald J. Hughes, Brookhaven National Laboratory

II. ELEMENTARY AND SECONDARY PROJECTS

A. Multidisciplinary

1. ELEMENTARY SCIENCE STUDY. Education Development Center (EDC), 55 Chapel St., Newton, Mass. 02160; Randolph R. Brown.

   a. Units commercially available from the Webster Division of McGraw-Hill Book Co., Manchester, Mo. 63011:

Attribute Games and Problems (Grades K-8)	
Teacher's Guide (pre-publication Trial Teaching Edition)	$1.80
Materials (include A Blocks, Color Cubes, and People Pieces for 5-6 students)	9.60
A Blocks for 5-6 students	3.90
Color Cubes for 5-6 students	3.45
People Pieces for 5-6 students	4.20
Problem Cards (pre-publication Trial Teaching Edition)	4.20
Stickers (non-permanent, pressure-sensitive stickers of six colors in circles, triangles, squares, and parallelograms)	2.55
Behavior of Mealworms (Grades 2-5)	
Teacher's Guide	3.00
Set of 6 illustrations	1.11
Bones (Grades 4-6)	
Teacher's Guide	in prep.
Bone Picture Book	1.20
How to Make a Chicken Skeleton	1.35
Picture Packet for Bones	3.90
Class Kit for Bones (includes 2 cats, 3 rabbits, 1 mink skeleton and 6 trays)	in prep.
Cat Skeleton	in prep.
Mink Skeleton	in prep.
Rabbit Skeleton	in prep.
Trays for Bones	in prep.
Mystery Bones	in prep.
Gases and "Airs" (Grades 5-8)	
Teacher's Guide	3.00
Teacher's Kit	49.00
6-Student Kit	19.50
Worksheets (6 each of 6 worksheets)	2.58

Growing Seeds (Grades K-3)	
Teacher's Guide	$ 2.25
Class Kit for 30 students	16.50
Film Loops:	
Bean Sprouts	11.50
Plant Growth-Graphing	11.50
Kitchen Physics (Grades 5-7)	
Teacher's Guide	2.25
Teacher's Kit	24.00
6-student Kit	26.50
Worksheets (6 each of 8 worksheets)	1.62
Light and Shadows (Grades K-4)	
Teacher's Guide	1.50
Mirror Cards (Grades 1-7)	
Teacher's Guide	2.32
Materials for Mirror Cards (for 4 students)	10.80
Mystery Powders (Grades 3-4)	
Teacher's Guide	.90
Small Things (Grades 4-6)	
Teacher's Guide	3.00
Teacher's Kit	28.50
6-student Kit	28.50
Worksheets (6 each of 23 worksheets)	4.89
Set of 20 illustrations	2.70
Microscope with Compound Attachment	3.75
The Faithful Eye of Robert Hook (supplementary book)	.51
Tangrams (Grades K-3)	
Teacher's Guide	1.50
Tangram Cards (1 set)	2.70
Tangram Pieces (for 4 students)	2.70
Where Is the Moon? (Grades 3-7)	
Where Is the Moon?(Teacher's Guide)	2.88
Where Was the Moon? (Student's Book)	.39
Reminders--1968 (for 1 student)	in prep.
Supplementary Student Books	
How Barn Owls Hunt	.76
How a Moth Escapes Its Cocoon	.88
The Curious Gerbils	.60

b. Trial Teaching Editions. Distributed by ESS to selected classrooms. Any remaining copies are sold by the Science Service Desk of the Webster Division of McGraw-Hill.

Batteries and Bulbs (Grades 5-8)	
Teacher's Guide (1 each of 4 guides)	$ 6.00
Class Kit of Materials (for 30 students)	in prep.
Changes (Grades 1-4)	
Teacher's Guide, including supplementary booklet "What Happens to Trash and Garbage?"	1.20
Drops, Streams, and Containers (Grades 1-3)	
Teacher's Guide	.90
Eggs and Tadpoles (Grades K-8)	
Teacher's Guide	1.80
Euglena (Grades 6-8--can be taught independently or as a supplement to Small Things)	
Teacher's Guide	.90
Geo Blocks (Grades K-3)	
Teacher's Guide	1.92
Materials (1 set of 322 blocks)	28.00
Microgardening (Grades 4-7)	
Teacher's Guide	2.50
Illustrated Handbook of Some Common Molds	3.30
The Microgardening Cookbook	1.20
Basic Kit, for 30 students. (Will be available in commercial edition only)	in prep.
Advanced Kit, for 30 students. (Will be available in commercial edition only)	in prep.
Peas and Particles (Grades 4-6)	
Teacher's Guide	1.20
Pendulums (Grades 4-7)	
Teacher's Guide	1.80
8-Student Kit	in prep.
Class Kit (for some 30 students)	in prep.
Pond Water (Grades 4-6)	
Teacher's Guide	1.62
Cards for Pond Water (suggest 1 set for 6 students)	1.95

<u>Primary Balancing</u> (Grades K-3)	
The Balance Book (Teacher's Guide)	2.50
Mobiles (a booklet for teachers)	.90
<u>Rocks and Charts</u> (Grades 3-6)	
Teacher's Guide	1.20

c. Films and Film Loops. Films are 16mm; loops are Super 8mm, running 3-4 minutes. All are in color, with the exception of the <u>Bones</u> x-ray motion pictures.

Available from the following distributors (information on purchase or rental should be obtained directly from these distributors):

Association Instructional Materials
600 Madison Ave.
New York, N. Y. 10022

The Ealing Corporation
2225 Massachusetts Ave.
Cambridge, Mass. 02140

Kaydee Films, Ltd.
National Instructional Films
58 East Route 59
Nanuet, N. Y. 10954

Macalaster Scientific Company
186 Third Ave.
Waltham, Mass. 02154

McGraw-Hill Book Company
Webster Division
Manchester Rd.
Manchester, Mo. 63011

Modern Talking Picture Service, Inc.
1212 Avenue of the Americas
New York, N. Y. 10036

Popular Science Publishing Company
A-V Division, Inc.
355 Lexington Ave.
New York, N. Y. 10017

Universal Education and Visual Arts
221 Park Avenue South
New York, N. Y. 10003

(1) Films and Film Loops for Students

Film: How to Make a Mealworm Back Up* (16mm, sound, black-and-white; available from EDC Film Library only)

Film Loops: Bones (articulated, living human bones in x-ray motion pictures)

Head and Neck
Shoulder
Knee and Elbow
Hand
Foot

Film: Brine Shrimp (16mm, silent, color, 7 min.)

Film Loops: Brine Shrimp I
Brine Shrimp II

Film: The Life of a Butterfly (16mm, silent, color, 18 min.)

Film Loops: (Black Swallowtail Butterfly)

Egg-laying, Hatching and Larvae
Larval Molt
Preparing to Pupate I
Preparing to Pupate II
Pupal Molt
Emergence

Films: Frog Development: Fertilization to Hatching (16mm, silent, color, 12 min.)
Frog Development: Hatching Through Metamorphosis (16mm, silent, color, 9½ min.)

Film Loops: Frog Egg I: First Cell Division to Early Neural Fold
Frog Egg II: Development of the Body Regions
Frog Egg III: Continued Development to Hatching
Frogs: Pairing and Egg Laying
Artificial Fertilization of Frog Eggs
Frogs: Pituitary Preparation
Tadpoles I (in prep.)
Tadpoles II (in prep.)

Film: Gases and "Airs" (16mm, sound, black-and-white, 32 min.)

*See (2), Classroom Films.

Film Loops: Candle Burning I
Candle Burning II
Candle Burning Techniques
The Mouse and the Candle

Film Loops: Growing Seeds
Bean Sprouts
Plant Growth-Graphing

Film Loops: Kitchen Physics
Beading of a Water Column
Water Rise in Blotter Strips of Graded Width
Water Rise in Blotter Strips Exposed and Enclosed

Film Loops: Microgardening
Alternaria
Rhizopus
Fusarium
Penicillium
Trichoderma Growth Rings
Rotting Pear
Mushroom Growth and Reaction

Film Loops: Pendulums
Sand Pendulum I: Drawing Circles, Lines, and Ellipses
Sand Pendulum II: Drawing on a Turntable
Sand Pendulum III: Drawing Lines on a Traveling Table
Sand Pendulum IV: Slowing Down
Sand Pendulum V: Pouring Sand into Soda Straws

Films: A Small Things Classroom* (16mm, sound, black-and-white, 23 min.)
Paramecium, Euglena, and Amoeba (16mm, sound, color, 15 min.)

Film Loops: Paramecium
Euglena
Amoeba
Budding of Yeast Cells
Blepharisma
Stentor
Rotifer
Vorticella
Volvox

*See (2), Classroom Films.

Film Loops (continued):

Stylonychia
Comparative Sizes of Microscopic Animals

(2) Classroom Films (teacher demonstration)

Available for purchase from Webster Division of McGraw-Hill; rental from EDC Film Library:

16mm, sound, black-and-white, 32 min.

Gases and "Airs" in the Classroom

Purchase or rental from EDC Film Library:

16mm, sound, black-and-white

How to Make a Mealworm Back Up (40 min.)
A Small Things Classroom (24 min.)
Classrooms in Transition (31 min.)
Another Way to Learn (11 min.)

2. SCIENCE CURRICULUM IMPROVEMENT STUDY. University of California, Berkeley, Calif. 94720; Robert Karplus, Department of Physics.

a. Text materials for grades K-6 available from D. C. Heath and Company, 285 Columbus Ave., Boston, Mass. 02116:

Material Objects	$1.00
Organisms	3.00
Interaction	1.50
Systems and Subsystems	2.25
Relativity	2.00

b. Teacher training films available for rent from University Extension Media Center, 2223 Fulton St., Berkeley Calif. 94720:

16mm, sound

Material Objects Overview (14 min.)
Observing Liquids (15 min.)
Experimenting with Air (15 min.)
Interaction Overview (11 min.)
Interaction Documentary (10 min.)
Relativity Overview (15 min.)

3. AAAS COMMISSION ON SCIENCE EDUCATION. American Association for the Advancement of Science, 1515 Massachusetts Avenue, N. W., Washington, D. C. 20005; John R. Mayor, Director of Education.

Available from the Xerox Corporation, 600 Madison Ave., New York, N. Y. 10022:

Science--A Process Approach, individual classroom unit for grades K-6 complete for 30 pupils, Parts A, B, C, D, and E; includes a Science Materials Kit and one set of Teaching Guides.

4. PHYSICAL SCIENCE STUDY COMMITTEE--INTRODUCTORY PHYSICAL SCIENCE. Education Development Center, 55 Chapel St., Newton, Mass. 02160; Uri Haber-Schaim.

a. Text, Prentice-Hall, Inc., Englewood Cliffs, N. J. 07631:

Introductory Physical Science	
Hardback	$2.79
Paperback	1.98
Teachers Guide	4.71
Achievement Test package	9.45

b. Available from Modern Learning Aids, 1212 Avenue of the Americas, New York, N. Y. 10036:

Films, 16mm, black-and-white, unless otherwise indicated

Definite and Multiple Proportions (30 min.), with Robert St. George, Cambridge School, and Jerrold R. Zacharias, M.I.T.
Elements, Compounds and Mixtures (color, 33 min.), with Iral Johns, Monsanto Chemical Co.
Crystals (color, black-and-white, 25 min.), with Alan Holden, Bell Telephone Laboratories
Behavior of Gases (15 min.), with Lee Gradzins, M.I.T.
The Mass of Atoms (Part I, 20 min.; Part II, 27 min.), with Raymond Hertz and Charles Brewer, Monsanto Research Corp.

5. SECONDARY SCHOOL SCIENCE PROJECT. Rutgers - The State University, New Brunswick, N. J. 08903; George Pallrand.

Available from the Webster Division of McGraw-Hill Book Company, Manchester Rd., Manchester, Mo. 63011:

Time, Space, and Matter ... Investigating the Physical World, a course of study

a. Student Record Book (written observations by each student) $.99

b. Student Investigation Books

Encountering the Physical World	$ .60
Exploring a Slice of the Earth	.60
From Microcosm to Macrocosm	.60
Levels of Approximation	.39
Dimensions and Motions	1.29
The Surface of the Earth	.99
The Grand Canyon of the Colorado	.60
The Surface of the Moon	1.17
Worlds in Space	.99

c. Teacher Folios (to accompany each Investigation, first 5 of 9)

Teacher Folio 1	$ .99
Teacher Folio 2	.99
Teacher Folio 3	.99
Teacher Folio 4	1.47
Teacher Folio 5	3.21 (approx.)

d. Science Reading Series (student background material)

First Through the Canyon	$ .48
The Lunar First	.39
On a Piece of Chalk	.36
Arizona Crater: The Case for Impact	.39
A Strange Crater in Arizona	.39
Motions of Earth About a Fixed Sun	.39 (approx.)

e. Overview Book for teachers (inquire of project headquarters, address above).

f. Equipment packages for students, classroom, and teacher, available from publisher.

6. "TIME FOR SCIENCE" ENRICHMENT SERIES FOR TELEVISION. Greater Washington Educational Television Association, Inc., 1225 19th St., N. W., Washington, D. C. 20036; Mrs. Edmund D. Campbell.

Rental or sale of kinescopes: Ralph W. Collett, Norwood Studios, 926 New Jersey Ave., N. W., Washington, D. C. 20001.

B. Astronomy, Atmospheric and Earth Sciences

1. MONOGRAPH SERIES IN METEOROLOGY. American Meteorological Society, 45 Beacon St., Boston, Mass. 02108; Kenneth Spengler.

The first six of approximately 20 paperbound monographs, published as part of the Science Study Series* by Anchor Books, Doubleday & Co., 501 Franklin Ave., Garden City, N.Y. 11530. Prices range from $1.00 to $1.50.

The Unclean Sky (Battan)
Weather on the Planets (Ohring)
Watching for the Wind (Edinger)
From Raindrops to Volcanoes (Blanchard)
Jet Streams (Reiter)
The Edge of Space (Craig)

2. MOTION PICTURES, FILMSTRIPS, AND SLIDES IN METEOROLOGY. American Meteorological Society, 45 Beacon St., Boston, Mass. 02108; Kenneth Spengler.

Available from the following distributors:

Modern Learning Aids
1212 Avenue of the Americas
New York, N. Y. 10036

Universal Education and Visual Arts
221 Park Avenue South
New York, N. Y. 10003

16mm, sound

Above the Horizon (color, 21 min.)
Formation of Raindrops (color, 26 min.)
Solar Radiation I: Sun and Earth (color, 18 min.)
Sea-Surface Meteorology (black-and-white, 26 min.)
Planetary Circulation of the Atmosphere (black-and-white, 27 min.)
Solar Radiation II: Spectrum and Atmosphere (color, 24 min.)

8mm and 16mm, silent, 4 min.

Laboratory Nucleation of Supercooled Clouds (black-and-white)
Homogeneous Nucleation and the Polar Nature of Ice Crystals (black-and-white)
Condensation Nuclei (color)

3. ASTRONOMICAL MOTION PICTURES FOR SECONDARY SCHOOLS. American Astronomical Society, 265 Fitz-Randolph Rd., Princeton, N. J. 08540; Paul M. Routly, Executive Officer.

Modern Learning Aids, 1212 Avenue of the Americas, New York, N.Y. 10036:

16mm, sound, color, 28½ min.

A Radio View of the Universe
Exploring the Milky Way

*See page 34 for other listings in the Science Study Series.

4. COLUMBIA-LAMONT MARINE SCIENCE FILMS. Lamont Geological Observatory, Palisades, N. Y. 10964; Maurice Ewing.

McGraw-Hill Films, 330 West 42nd St., New York, N. Y. 10036:

16mm, sound, color, 25-30 min.

History Layer by Layer, with David B. Ericson, Lamont Geological Observatory
Adaptation to a Marine Environment, with Malcolm Gordon, University of California, Los Angeles
Waves Across the Pacific, with Walter Munk, Institute of Planetary Sciences, La Jolla, Calif.
The Earth Beneath the Sea, with Maurice Ewing, Lamont Geological Observatory

5. OCEANOGRAPHY--EIGHT NARRATED FILMSTRIPS. Committee on Oceanography, National Academy of Sciences-National Research Council, 2101 Constitution Ave., N. W., Washington, D. C. 20418; Richard C. Vetter.

Available from Encyclopaedia Britannica Films, Inc., 1150 Wilmette Ave., Wilmette, Ill. 60091:

35mm filmstrips, color, 15 min., and records

A Career in Oceanography
Physical Oceanography
Geological Oceanography
Chemical Oceanography
Biological Oceanography
Marine Resources
Air-Sea Interaction
Ocean Engineering

6. EARTH SCIENCE CURRICULUM PROJECT (ESCP). American Geological Institute; Joseph L. Weitz, ESCP, P.O. Box 1559, Boulder, Colo. 80302.

a. Houghton Mifflin Co., 2 Park St., Boston, Mass. 02107:

Investigating the Earth (1967)

Text with integrated laboratory investigations	$ 8.00
2-volume Teacher's Guide (school price less 25%; guide free with classroom quantities of textbook)	10.00

b. Prentice-Hall, Inc., Englewood Cliffs, N. J. 07631:

ESCP Reference Series (first 9 pamphlets)

RS-1 Sources of Earth Science Information
RS-2 Selected References for Earth Science Courses
RS-3 Selected Earth Science Films
RS-4 Selected Maps and Earth Science Publications
RS-5 Free Materials for Earth Science Teachers
RS-6 Planetariums, Observatories, and Earth Science Exhibits
RS-7 Topographic Maps and How to Use Them
RS-8 Basic Data and Water Budget Computation for Selected Cities in North America
RS-9 Selected Guide for Geologic Field Study in Canada and the United States

c. ESCP Film Series

Available from Encyclopaedia Britannica Educational Corp., 1150 Wilmette Ave., Wilmette, Ill. 60091:

Toward Inquiry (16mm, sound, black-and-white, 20 min.)
How Solid is Rock? (16mm, sound, color, 19 min.)

7. TEACHING RESOURCES DEVELOPMENT PROGRAM IN THE GEOLOGICAL SCIENCES. American Geological Institute; Robert L. Heller, Dept. of Geology, University of Minnesota, Duluth, Minn. 55814.

Holt, Rinehart & Winston, Inc., 383 Madison Ave., New York, N. Y. 10017:

Geology and Earth Sciences Sourcebook for Elementary and Secondary Schools (1962), $3.40

8. MANUAL OF LECTURE DEMONSTRATIONS, LABORATORY EXPERIMENTS, AND OBSERVATIONAL EQUIPMENT FOR ELEMENTARY METEOROLOGY. The Pennsylvania State University, University Park, Pa. 16802; Hans Neuberger, Department of Meteorology.

Manual describes 50 meteorological demonstrations, experiments and observations. Includes illustrated directions for construction of necessary equipment. Available at $2 (check payable to Pennsylvania State University) by writing to Department of Meteorology, 503 Deike Bldg., The Pennsylvania State University, University Park, Pa. 16802.

C. Biology

1. BIOLOGICAL SCIENCES CURRICULUM STUDY (BSCS). P. O. Box 930, University of Colorado, Boulder, Colo. 80302; William V. Mayer.

a. High School Text in Three Versions (1968):

(1) Houghton Mifflin Co., 110 Tremont St., Boston, Mass. 02107

Blue Version--Biological Science: Molecules to Man, molecular-biochemical-evolutionary approach. Includes text and laboratory investigations in one volume ($7.40).

(2) Rand McNally & Co., P. O. Box 7600, Chicago, Ill. 60680

Green Version--High School Biology, BSCS Green Version, ecological-evolutionary approach. Includes text and laboratory investigations in one volume ($6.84).

(3) Harcourt, Brace & World, Inc., 757 Third Ave., New York, N. Y. 10017

Yellow Version--Biological Science: An Inquiry Into Life, cellular-biochemical-evolutionary approach. Text and separate laboratory investigations ($6.60).

b. BSCS Version Quarterly Test (version publishers).

c. BSCS Comprehensive Final Exam (The Psychological Corp.), for classroom use only.

d. BSCS Biology, Special Materials--Biological Science: Patterns and Processes (for less able students), Holt, Rinehart & Winston, Inc., 383 Madison Ave., New York, N. Y. 10017, $6.75 for non-classroom use only, net $2.70 to schools, for tests The Psychological Corp.

e. BSCS Biology, Second Course--Biological Science: Interaction of Experiments and Ideas (for 12th grade), Prentice-Hall, Inc., Englewood Cliffs, N. J. 07631:

Textbook	$ 6.60
Teachers Edition (annotated)	7.20

f. BSCS Laboratory Blocks (D. C. Heath & Co., 285 Columbus Ave., Boston, Mass. 02116):

Plant Growth and Development (Lee)	$ 1.52
Teacher's Supplement	1.04
Animal Growth and Development (Moog)	1.44
Teacher's Supplement	1.04

f. BSCS Laboratory Blocks (continued):

Microbes: Their Growth, Nutrition and Interaction (Sussman)	$ 1.84
Teacher's Supplement	1.32
The Complementarity of Structure and Function (Richards)	1.44
Teacher's Supplement	1.04
Regulation in Plants by Hormones (Jacobs, LaMotte)	1.80
Teacher's Supplement	.84
Field Ecology (Phillips)	1.80
Teacher's Supplement	.68
Animal Behavior (Follansbee)	1.44
Teacher's Supplement	.96
The Molecular Basis of Metabolism (Albersheim)	in press
Teacher's Supplement	" "
Physiological Adaptation (Segal)	" "
Teacher's Supplement	" "
Genetic Continuity (Glass)	2.00
Teacher's Supplement	1.32
Life in the Soil (Pramer)	1.36
Teacher's Supplement	.84

g. Innovations in Equipment and Techniques for the Biology Teaching Laboratory, D. C. Heath & Co., 285 Columbus Ave., Boston, Mass. 02116, $2.20.

h. Biology Teachers' Handbook, John Wiley & Sons, Inc., 605 Third Ave., New York, N. Y. 10016, $7.95.

i. Research Problems in Biology: Investigations for Students, Doubleday & Co., 501 Franklin Ave., Garden City, N. Y. 11530 (Series 1, 2, 3 or 4), $1.25.

j. BSCS Bulletin Series, BSCS, P. O. Box 930, Boulder, Colo. 80302:

#1	Biological Education in American Secondary Schools 1890-1960 (Hurd)	$ 3.50
#2	Teaching High School Biology: A Guide to Working with Potential Biologists (Brandwein, Metzner, Morholt, Roe, Rosen)	2.50
#3	BSCS Biology: Implementation in the Schools (Grobman, Hurd, Lawler, Palmer)	
	Hardback	5.00
	Paperbound	3.50

k. BSCS Special Publication Series, BSCS, P. O. Box 930, Boulder, Colo. 80302 (free only for teacher education programs):

#1 and #2 (out of print; absorbed by Number 3 below)
#3 BSCS Materials for Preparation of In-Service Teachers of Biology (Andrews)
#4 The Teacher and BSCS Special Materials (Liebherr, Peterson, eds.)
#5 Laboratory Blocks in Teaching Biology (Lee, ed.)

l. BSCS Pamphlet Series (D. C. Heath & Co., 285 Columbus Ave., Boston, Mass. 02116), $.60 each:

1. Guideposts of Animal Navigation (Carr)
2. Biological Clocks (Brown)
3. Courtship in Animals (Meyerriecks)
4. Bioelectricity (Suckling)
5. Biomechanics of the Body (Du Brul)
6. Present Problems About the Past (Auffenberg)
7. Metabolites of the Sea (Nigrelli)
8. Blood Cell Physiology (Gordon)
9. Homeostatic Regulation (Overmire)
10. Biology of Coral Atolls (Boolootian)
11. Early Evolution of Life (Young, Ponnamperuma)
12. Population Genetics (Wallace)
13. Slime Molds and Research (Alexopoulos, Koevenig)
14. Cell Division (Mazia)
15. Photoperiodism in Animals (Farner)
16. Growth and Age (Milne and Milne)
17. Biology of Termites (Miller)
18. Biogeography (Neill)
19. Hibernation (Mayer)
20. Animal Language (Collias)
21. Ecology of the African Elephant (Quick)
22. Cellulose in Animal Nutrition (Hungate)
23. Plant Systematics (Raven, Mertens)
24. Photosynthesis (Gaffron)

m. BSCS Films

(1) Available from BSCS on loan:

BSCS Information Film The Story of BSCS (16mm, sound, color, 22 min.)

(2) Biological Techniques Film Series (produced without NSF support). Available from Thorne Films, 1229 University Ave., Boulder, Colo. 80302:

16mm, sound, color

Bacteriological Techniques (5 min.)
Culturing Slime Mold Plasmodium (5 min.)

Biological Techniques Film Series (continued):

Genetics Techniques: Handling Drosophila (3 min.)
Measuring Techniques (14 min.)
Neurospora Techniques (8 min.)
Paper Chromatography (14 min.)
Removing Frog Pituitary (1 min.)
Smear and Squash Techniques (5½ min.)
Weighing Techniques (8 min.)

(3) BSCS Single Topic Films

Available in Super 8mm cartridges for Technicolor projectors only, from the version publishers--Harcourt Brace & World, Inc., 757 Third Ave., New York, N. Y. 10017; Houghton Mifflin Co., 110 Tremont St., Boston, Mass. 02107; Rand McNally & Co., P. O. Box 7600, Chicago, Ill. 60680:

Social Behavior in Chickens
Prairies and Deciduous Forests
The Peppered Moth: A Population Study
Mimicry
Water and Desert Plants
Water and Desert Animals
Temperature and Activity in Reptiles
Mountain Trees--An Ecological Study
The Kidney and Homeostasis
Phototropism
Convergence
Australian Marsupials
The Intertidal Region
Life in the Intertidal Region
Predation and Protection in the Ocean
Mating Behavior in the Cockroach
An Inquiry--The Importance of the Nucleus
Mitosis
Grouse--A Species Problem
An Example of the Biological Significance of Color

2. LIVING BIOLOGY FILM SERIES. Yeshiva University, 55 Fifth Ave., New York, N. Y. 10003; John J. Lee, Chairman, Steering Committee (American Museum of Natural History).

McGraw Hill Book Co., Inc., 340 W. 42nd St., New York, N. Y. 10036

16mm, sound, color, 28½ min.

Life of the Pond
The Standing Water
Life in the Pond
The World of Many Habitats

The Living Tide
The Rocky Shore
The Brim of Sand
The Edge of Sea
Microscopic Algae

3. COMMITTEE ON EDUCATIONAL POLICIES IN BIOLOGY. National Academy of Sciences-National Research Council, 2101 Constitution Ave., N.W., Washington, D. C. 20418.

Holt, Rinehart and Winston, 383 Madison Ave., New York, N. Y. 10017:

Laboratory and Field Studies in Biology, a Source Book for Secondary Schools, teacher and student editions (Lawson, Paulson) (1960), $1.80

4. THE NATURE OF VIRUSES. University of California, Berkeley, Calif. 94720; Wendell M. Stanley, Virus Laboratory.

a. E. P. Dutton & Co., Inc., 201 Park Ave., S., New York, N. Y. 10003:

Viruses and the Nature of Life (Stanley, Valens) (1961), $1.95. Based on television series (see following).

b. Available from N.E.T. Film Service, Indiana University, Bloomington, Ind. 47405:

16mm, sound, black-and-white, 30 min.

Between the Living and the Non-Living, with Wendell M. Stanley
Giant Molecules, with Robley C. Williams
The Stuff of Life, with C. Arthur Knight
Viral Genes, with Gunther S. Stent
How a Virus Kills, with Arthur B. Pardee
Threads of Life, with Heinz L. Fraenkel-Conrat
Killers and Carcinogens, with Harry Rubin
Cancer, with Wendell M. Stanley

D. Chemistry

1. CHEMICAL EDUCATION MATERIAL STUDY (CHEM Study). University of California, Berkeley, Calif. 94720; George C. Pimentel, Dept. of Chemistry.

a. W. H. Freeman and Co., 660 Market St., San Francisco, Calif. 94104:

Chemistry--An Experimental Science (2nd ed., 1965)	
Text	$5.80
Laboratory Manual	1.60
Teacher's Guide	7.00

CHEM Study Achievement Examination

Programed Instruction Pamphlets ($.50 set)
Exponential Notation
The Slide Rule

b. Prentice-Hall, Inc., Englewood Cliffs, N. J. 07631 -- monographs ($1.50 each):

Man-Made Transuranium Elements (Seaborg)
Why Do Chemical Reactions Occur? (Campbell)

c. CHEM Study films available from Modern Learning Aids, 1212 Avenue of the Americas, New York, N. Y. 10036:

(1) Classroom films, 16mm, sound, color except as noted

Gases and How They Combine (22 min.), with George C. Pimentel, University of California (B)
Gas Pressure and Molecular Collisions (black-and-white, 21 min.), with J. Arthur Campbell, Harvey Mudd College
Electric Interactions in Chemistry (21 min.), with J. Leland Hollenberg, University of Redlands, and J. Arthur Campbell, Harvey Mudd College
Chemical Families (22 min.), with J. Leland Hollenberg, University of Redlands, and J. Arthur Campbell, Harvey Mudd College
Molecular Motions (13 min.), with J. Arthur Campbell, Harvey Mudd College
Vibration of Molecules (12 min.), with Linus Pauling and Richard M. Badger, California Institute of Technology (in cooperation with American Chemical Society)
Introduction to Reaction Kinetics (13 min.), with Henry Eyring, University of Utah (in cooperation with American Chemical Society)

CHEM Study Classroom Films continued:

Equilibrium (24 min.), with George C. Pimentel, University of California (B)
Catalysis (17 min.), with Richard E. Powell, University of California (B) (in cooperation with Manufacturing Chemists' Association)
Acid-Base Indicators (19 min.), with J. Arthur Campbell, Harvey Mudd College
Nitric Acid (18 min.), with Harry H. Sisler, University of Florida (in cooperation with Manufacturing Chemists' Association
Crystals and Their Structures (black-and-white, 22 min.), with J. Arthur Campbell, Harvey Mudd College
Molecular Spectroscopy (23 min.), with Bryce Crawford, Jr. and John Overend, University of Minnesota
The Hydrogen Atom--as Viewed by Quantum Mechanics (standard version) (13 min.), with George C. Pimentel, University of California (B)
The Hydrogen Atom--as Viewed by Quantum Mechanics (advanced version) (20 min.), with George C. Pimentel, University of California (B)
Ionization Energy (22 min.), with Bruce H. Mahan, University of California (B)
Shapes and Polarities of Molecules (18 min.), with David Dows, University of Southern California, Los Angeles
A Research Problem: Inert (?) Gas Compounds (19 min.), with George C. Pimentel, University of California (B), and J. J. Turner, Cambridge University, Cambridge, England
Synthesis of an Organic Compound (22 min.), with T. A. Geissman, University of California, Los Angeles
Mechanism of an Organic Reaction (20 min.), with Henry Rapoport, University of California (B)
Bromine--Element from the Sea (22 min.), with J. Leland Hollenberg, University of Redlands, and James E. Magner, Dow Chemical Company
Vanadium--A Transition Element (22 min.), with Robert Brasted, University of Minnesota
High Temperature Research (19 min.), with Paul W. Gilles, University of Kansas
Transuranium Elements (23 min.), with Glenn T. Seaborg, Atomic Energy Commission
Electrochemical Cells (22 min.), with J. Arthur Campbell, Harvey Mudd College, and June S. Ewing, CHEM Study Staff
Chemical Bonding (16 min.), with George C. Pimentel, University of California (B)
Biochemistry and Molecular Structure (22 min.), with Donald E. Rounds, Pasadena Foundation for Medical Research
Pimentel Discusses the Hydrogen Atom (black-and-white, 32 min.)
Pimentel Discusses Chemical Bonding (black-and-white, 29 min.)

(2) Informational films, 16mm, sound, color

A Chance to Wonder Why (14 min.), with Lawrence D. Lynch and students, Beverly Hills High School
CHEM Study: Information for Educators (19 min.), with the CHEM Study staff

(3) Teacher training series, 16mm, sound, black-and-white

Teacher Training Introduction to "Gases and How They Combine" (12 min.), with J. Arthur Campbell, Harvey Mudd College, and George C. Pimentel, University of California (B)
Teacher Training Introduction to "Chemical Families" (7 min.), with J. Arthur Campbell, Harvey Mudd College
Teacher Training Introduction to "Reaction Kinetics" (16 min.), with J. Arthur Campbell, Harvey Mudd College
Teacher Training Introduction to "Catalysis" (13 min.), with George C. Pimentel, University of California (B)
Teacher Training Introduction to "Equilibrium" (7 min.), with George C. Pimentel, University of California (B)
Teacher Training Introduction to "Electrochemical Cells" (8 min.), with Richard J. Merrill, Mt. Diablo Unified School District
Teacher Training Introduction to "The Hydrogen Atom--as Viewed by Quantum Mechanics" (9 min.), with George C. Pimentel, University of California (B)
A Panel Feedback Session (29 min.), with CHEM Study staff and high school teachers
Teacher Training Introduction to "Ionization Energy" (8 min.), with J. Arthur Campbell, Harvey Mudd College
Teacher Training Introduction to "Chemical Bonding" (14 min.), with George C. Pimentel, University of California (B)
Teacher Training Introduction to "Crystals and Their Structures" (7 min.), with J. Arthur Campbell, Harvey Mudd College
Teacher Training Introduction to "Vanadium--A Transition Element" (7 min.), with J. Arthur Campbell, Harvey Mudd College
Teacher Training Introduction to "Mechanism of an Organic Reaction" (9 min.), with Henry Rapoport, University of California (B)
Teacher Training Introduction to "Biochemistry and Molecular Structure" (7 min.), with J. Arthur Campbell, Harvey Mudd College
A Discussion Among Teachers and the CHEM Study Staff--Concluding Panel Session (29 min.)

2. CHEMICAL BOND APPROACH PROJECT (CBA). Earlham College, Richmond, Ind. 47375; Laurence E. Strong, Dept. of Chemistry.

a. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York, N. Y. 10036:

Chemical Systems (1965)	
Text	$6.96
Teachers' Guide	5.00
Investigating Chemical Systems (1965)	
Student Laboratory Guide	2.12
Teachers' Guide	5.00

b. Reprints (available from CBA):

Supplemental Readings for Chemical Bond Approach, reprinted from "Journal of Chemical Education" and "Scientific American"

3. VISUAL AIDS FOR TEACHING CHEMISTRY. University of Iowa, Iowa City, Iowa 52240: R. T. Sanderson--present address: Arizona State University, Tempe, Ariz. 85281.

a. D. Van Nostrand Co., Inc., Princeton, N. J. 08540:

Teaching Chemistry with Models (Sanderson) (1962), $5.75

b. Film available from Extension Division, University of Iowa, Iowa City, Iowa 54440:

16mm, sound, color, 45 min.

Atomic Models, Valence, and the Periodic Table
New Models of Molecules, Ions, and Crystals: Their Construction and General Use in Teaching Chemistry
A Special Set of Models for Introducing Chemistry

E. Mathematics

1. SCHOOL MATHEMATICS STUDY GROUP (SMSG). Stanford University, Stanford, Calif. 94305; E. G. Begle, School of Education.

Available from A. C. Vroman, Inc., 367 South Pasadena Ave., Pasadena, Calif. 91105:

a. Mathematics for the Elementary School

Book K, Teacher's Commentary	$1.50
Book 1, Student's Text	1.50
Teacher's Commentary	3.00
Book 2, Student's Text	1.50
Teacher's Commentary	3.00
Book 3, Student's Text, Parts I and II	3.00
Teacher's Commentary, Parts I and II	3.00
Grade 4, Student's Text, Parts I and II	3.00
Teacher's Commentary , Parts I and II	3.00
Grade 5, Student's Text, Parts I and II	3.00
Teacher's Commentary, Parts I and II	3.00
Grade 6, Student's Text, Parts I and II	3.00
Teacher's Commentary, Parts I and II	3.00

b. Mathematics for the Elementary School

Special Editions

Book K, Teacher's Commentary	1.00
Book 1, Student's Text, Parts I and II	1.50
Teacher's Commentary, Parts I and II	3.00
Developing Mathematics Readiness in Pre-School Programs	.75

c. Mathematics for Junior High School

Volume 1, Student's Text, Parts I and II	3.00
Teacher's Commentary, Parts I and II	3.00
Volume 2, Student's Text, Parts I and II	3.00
Teacher's Commentary, Parts I and II	3.00

d. Texts for Slower Students

Introduction to Secondary School Mathematics

Volume 1, Student's Text, Parts I and II	3.00
Teacher's Commentary, Parts I and II	3.00

d. Texts for Slower Students (continued)

Introduction to Secondary School Mathematics (continued)	
Volume 2, Student's Text, Parts I and II	$3.00
Teacher's Commentary	3.00
Introduction to Algebra	
Student's Text, Parts I and II	3.00
Teacher's Commentary, Parts I and II	3.00

e. High School Texts

First Course in Algebra, Student's Text, Parts I and II	3.00
First Course in Algebra, Teacher's Commentary, Parts I and II	3.00
Programed First Course in Algebra (Form H)	
Student's Text, Parts I and II	5.00
Student's Response Booklet	1.50
Teacher's Commentary	1.50
Geometry, Student's Text, Parts I and II	3.00
Teacher's Commentary, Parts I and II	3.00
Geometry with Coordinates	
Student's Text, Parts I and II	3.00
Teacher's Commentary, Parts I and II	3.00
Intermediate Mathematics	
Student's Text, Parts I and II	3.00
Teacher's Commentary, Parts I and II	3.00
Elementary Functions	
Student's Text	2.00
Teacher's Commentary	2.00
Introduction to Matrix Algebra	
Student's Text	2.00
Teacher's Commentary	2.00
Analytic Geometry	
Student's Text	2.00
Teacher's Commentary	2.00
Algorithms, Computation and Mathematics	
Student's Text	2.00
Teacher's Commentary	2.00
Fortran, Student's Text	1.00
Fortran, Teacher's Commentary	1.00
Algol, Student's Text	1.00
Algol, Teacher's Commentary	1.00
Calculus	
Student's Text, Parts I and II	3.00
Teacher's Commentary, Parts I and II	3.00
Student's Text, Part III	2.00
Teacher's Commentary, Part III	2.00

f. Supplementary Materials

Mathematics Through Science	
Measurement and Graphing, Student's Text, Part I	$1.00
Measurement and Graphing, Teacher's Commentary, Part I	1.50
Graphing, Equations and Linear Functions, Student's Text, Part II	1.00
Graphing, Equations and Linear Functions, Teacher's Commentary, Part II	1.50
An Experimental Approach to Functions, Student's Text, Part III	1.00
An Experimental Approach to Functions, Teacher's Commentary, Part III	1.50
Mathematics and Living Things, Student's Text	1.00
Mathematics and Living Things, Teacher's Commentary	1.50
Junior High School Mathematics Units	
Number Systems, Student's Text	1.25
Number Systems, Teacher's Commentary	1.25
Geometry, Student's Text	1.00
Geometry, Teacher's Commentary	1.00
Applications, Student's Text	.75
Applications, Teacher's Commentary	.75
Supplementary Units	
Junior High School, Student's Text	1.50
Junior High School, Teacher's Commentary	1.50
Essays on Number Theory I	.75
Essays on Number Theory II	.75
Development of the Real Number System	1.25
Selected Units, Grade 4 (E-4150)	1.00
Probability	
Primary Grades, Student's Text	.50
Primary Grades, Teacher's Commentary	2.00
Intermediate Grades, Student's Text	1.00
Intermediate Grades, Teacher's Commentary	2.00
Classroom Set of Spinners, Primary Grades	7.00
Classroom Set of Spinners, Intermediate Grades	7.00
Introduction to Probability, Basic Concepts Student's Text, Part I	1.00
Introduction to Probability, Special Topics Student's Text, Part II	1.00

g. Supplementary and Enrichment Series ($.40 each)

Functions
Circular Functions
Functions, Circular Functions, Teacher's Commentary
The Complex Number System
The Complex Number System, Teacher's Commentary
The System of Vectors
The System of Vectors, Teacher's Commentary
Non-Metric Geometry
Non-Metric Geometry, Teacher's Commentary
Plane Coordinate Geometry
Plane Coordinate Geometry, Teacher's Commentary
Inequalities
Inequalities, Teacher's Commentary
Numeration
Numeration, Teacher's Commentary
Algebraic Structures
Factors and Primes
Factors and Primes, Teacher's Commentary
Mathematical Systems
Mathematical Systems, Teacher's Commentary
Systems of First Degree Equation in Three Variables
Systems of First Degree Equation in Three Variables, Teacher's Commentary
Radioactive Decay
Absolute Value
Absolute Value, Teacher's Commentary
Mathematical Theory of the Struggle for Life
1 + 1 = ?

h. Reprint Series ($.40 each)

The Structure of Algebra
Prime Numbers and Perfect Numbers
What is Contemporary Mathematics
Mascheroni Constructions
Space, Intuition and Geometry
Nature and History of π
Computation of π
Mathematics and Music
The Golden Measure
Geometric Constructions

i. Studies in Mathematics

Euclidean Geometry Based on Ruler and Protractor Axioms	$1.50
Structure of Elementary Algebra	2.00
Geometry	3.50
Concepts of Informal Geometry	2.00
Number Systems	2.50
Intuitive Geometry	2.00

i. Studies in Mathematics (continued)

Concepts of Algebra	$2.50
Brief Course in Mathematics for Elementary School Teachers	2.50
Applied Mathematics in the High School	1.00
Mathematical Methods in Science	2.00
A Brief Course in Mathematics for Junior High School Teachers	4.00
Inservice Course for Primary School Teachers	2.50
Introduction to Number Systems	2.50
Calculus and Science	1.50
Some Uses of Mathematics	2.00
Mathematical Concepts of Elementary Measurement	4.00

j. Conference Reports

Elementary School Mathematics	.75
SMSG Experimental Centers	2.50
Elementary School Experimental Centers	2.00
Geometry with Coordinates	.75
Future Responsibilities for School Mathematics	.50
Mathematics Education for Below Average Achievers	1.00

k. Miscellaneous

Study Guides in Mathematics	.50
Very Short Course in Mathematics for Parents	.50
Philosophies and Procedures of SMSG Writing Teams	1.00
SMSG: The Making of a Curriculum	4.00

l. Spanish Translations

Texts and Teachers' Commentaries for grades 4 to 12 have been translated into Spanish for use in Puerto Rico and other Spanish-speaking countries. Also available are Studies in Mathematics, Volumes 5, 9 and 14. Further information can be obtained from the listing of Translations and Adaptations of Instructional Materials for Other Countries.

m. New Mathematical Library (monographs). Random House, 239 Great Neck Rd., Great Neck, N. Y. 11021 (trade edition), $1.95 each; L. W. Singer, 249-259 W. Erie Blvd., Syracuse, N. Y. 13202 (reduced school edition), $.99 each:

Numbers Rational and Irrational (Niven)
What is Calculus About? (Sawyer)
An Introduction to Inequalities (Beckenbach and Bellman)
Geometric Inequalities (Kazarinoff)
The Contest Problem Book (Salkind)
The Lore of Large Numbers (Davis)
Uses of Infinity (Zippin)
Geometric Transformations (Yaglom, Shields)
Continued Fractions (Olds)
Graphs and Their Uses (Ore)
Hungarian Problem Book I (Rapaport)
Hungarian Problem Book II (Rapaport)
Episodes from Early Mathematics (Aaboe)
Groups and Their Graphs (Grossman, Magnus)
Mathematics of Choice (Niven)
From Pythagoras to Einstein (Friedrichs)
The MAA Problem Book II (Salkind)
First Concepts of Topology (Chinn, Steenrod)
Geometry Revisited (Coxeter, Greitzer)

n. Filmed Course for Elementary School Teachers, with Stewart H. Moredock, available from Modern Learning Aids, 1212 Avenue of the Americas, New York, N. Y. 10036:

16mm, sound, color, 30 min.

Pre-Number Ideas
Whole Numbers
Names for Numbers
Numeration Systems
Place Value and Addition
Addition and Subtraction
Addition and Subtraction--Techniques
Multiplication
Division
Multiplication Techniques
Division Techniques
Sentences, Number Line
Points, Lines, Planes
Polygons and Angles
Metric Properties of Figures
Linear and Angular Measure
Factors and Primes
Introducing Rational Numbers
Equivalent Fractions
Addition and Subtraction of Rational Numbers

n. Filmed Course for Elementary School Teachers (continued):

Multiplication of Rational Numbers
Division of Rational Numbers
Decimals
Ratio, Rate, Percent
Congruence and Similarity
Solid Figures
Area
Measurement of Solids
Negative Rational Numbers
The Real Numbers

2. UNIVERSITY OF ILLINOIS COMMITTEE ON SCHOOL MATHEMATICS (UICSM). 1210 West Springfield, Urbana, Ill. 61801; Max Beberman, Director.

Filmed course for teachers of elementary algebra, Max Beberman, instructor. Available from Modern Learning Aids, 1212 Avenue of the Americas, New York, N. Y. 10036:

16mm, sound, black-and-white

Numbers and Numerals--Part I (26 min.)
Numbers and Numerals--Part II (25 min.)
Real Numbers: Developing the Concept (33½ min.)
Adding Real Numbers (35 min.)
Advent of Awareness (26½ min.)
Multiplying Real Numbers (37 min.)
Isomorphism: Developing the Concept (45 min.)
Punctuation and Conventions in Mathematics--
Part I. Punctuation (28 min.)
Punctuation and Conventions in Mathematics--
Part II. Conventions (32½ min.)
Operations: Binary, Singulary (23½ min.)
Operation Machines (23½ min.)
Inverses of Operations (25½ min.)
Functions: Foreshadowing the Concept (30½ min.)
Subtracting Real Numbers (29 min.)
Dividing Real Numbers (29 min.)
Basic Principles for Real Numbers--Part I. Principles of Arithmetic for Numbers of Arithmetic (38 min.)
Basic Principles for Real Numbers--Part II. Distributive Principles for Numbers of Arithmetic (39 min.)
Basic Principles for Real Numbers--Part III. Principles of Arithmetic for Real Numbers (20½ min.)
Basic Principles for Real Numbers--Part IV. Discovery and Patterns (35 min.)
Comparing Real Numbers: The Number Line (17 min.)
Prerequisite to Communication (22 min.)

Numerical Variables: Developing the Concept--
Part I (33 min.)
Numerical Variables: Developing the Concept--
Part II (30 min.)
Bound Variables: Matching Language with Awareness
(39½ min.)
Verbalizing Generalizations in the Classroom (19 min.)
Prelude to Deduction (29 min.)
Substitution and the Linking Rule (37 min.)
Prelude to Proof-Making (38½ min.)
Proving Generalizations--Part I. Test Pattern
Principle (31½ min.)
Proving Generalizations--Part II. Classroom Examples
(31 min.)
Organizing Knowledge by Deduction (46½ min.)
Principles and Discovery in Algebraic Manipulation--
Part I. Equivalent Expressions (21 min.)
Principles and Discovery in Algebraic Manipulation--
Part II. Simplification (31½ min.)
Principles and Discovery in Algebraic Manipulation--
Part III. Manipulating Fractions (39½ min.)
Principles and Discovery in Algebraic Manipulation--
Part IV. Some Other Common Cases (29 min.)
Sentences and Solution Sets (33 min.)
Naming Sets: The Set Abstractor (32½ min.)
Number Line Graphs of Solution Sets (19 min.)
Solving Equations--Informal Approach (27½ min.)
Logical Basis for Equation Transformation Principles--
Part I (31½ min.)
Logical Basis for Equation Transformation Principles--
Part II (31 min.)
Logical Basis for Equation Transformation Principles--
Part III (34 min.)
Subset of a Set: Developing the Concept (29 min.)
Equivalent Equations: Developing the Concept (43 min.)
Equivalent Equations and Transformation Principles
(30 min.)
Equation Transformation Principles in Practice--Part I
(28½ min.)
Equation Transformation Principles in Practice--Part II
(23 min.)
Transformation Principles for Inequations--Part I
(31 min.)
Transformation Principles for Inequations--Part II
(28½ min.)
Solving Worded Problems (27½ min.)

3. COMPUTER-BASED MATHEMATICS INSTRUCTION. Stanford University, Stanford, Calif. 94305; Patrick Suppes, Institute for Mathematical Studies in the Social Sciences.

a. L. W. Singer Co., 501,Madison Ave., New York, N. Y. 10022:

Sets and Numbers (1967), textbooks and accompanying teacher's manuals

Kindergarten	$1.24
Books 1 and 2	2.00
Books 3,4,5,6 (hard cover)	3.60
Books 3,4,5,6 (paper cover)	1.16

b. Ginn & Co., Statler Bldg., Boston, Mass. 02116:

First Course in Mathematical Logic (Suppes, Hill), (1964). For selected students in grades 5 to 9 and also for regular high school students. Includes accompanying manual of solutions ($5.60 each).

c. W. A. Palmer Films; available from Film Order Desk, Ventura Hall, Stanford University, Stanford, Calif. 94305:

16mm, sound, black-and-white, 7 min. film describing computer-assisted instruction via teletypes. For information and prices, write Film Order Desk at above address.

4. CAMBRIDGE CONFERENCE ON SCHOOL MATHEMATICS. Education Development Center, 55 Chapel St., Newton, Mass. 02160; William Ted Martin and Peter Hilton.

Houghton Mifflin Co., 2 Park St., Boston, Mass. 02107:

Goals for School Mathematics: The Report of the Cambridge Conference on School Mathematics (1963), $1.60

Goals for Mathematical Education of Elementary School Teachers: A Report of the Cambridge Conference on Teacher Training (1967), $1.80

5. COMPUTER TRAINING AND USE IN SECONDARY SCHOOLS. Dartmouth College, Hanover, N. H. 03755; Thomas E. Kurtz, Director, Kiewit Computation Center.

Dartmouth Publications, Dartmouth College, Hanover, N. H. 03755:

BASIC Manual, 4th ed. (Kemeny, Kurtz), (1966), $2.00

6. SYRACUSE UNIVERSITY-WEBSTER COLLEGE MADISON MATHEMATICS PROJECT. Madison Project, Webster College, Webster Groves, Mo. 63119; Robert B. Davis, Director.

Films on teaching mathematics in elementary school classrooms:

16mm, sound, black-and-white

First Lesson
Second Lesson
A Lesson with Second Graders
Graphing a Parabola
Guessing Functions
Postman Stories
Circles and Parabolas
Complex Numbers via Matrices
In-Service Course I
In-Service Course II

Some 8mm cartridge loops are also available.

7. IN-SERVICE FILMS IN MATHEMATICS FOR ELEMENTARY TEACHERS. National Council of Teachers of Mathematics, 1201 16th St., N.W., Washington, D. C. 20036; James D. Gates, Executive Secretary.

Available from Universal Education and Visual Arts, 221 Park Avenue South, New York, N. Y. 10003:

16mm, color, 30 min.

Beginning Number Concepts
Development of Our Decimal Numeration System
Addition and Its Properties
Multiplication and Its Properties
Subtraction
Division
Addition and Subtraction Algorithms
Multiplication Algorithms and the Distributive Property
Division Algorithms
The Whole Number System--Key Ideas

8. FOUNDATIONS OF MATHEMATICS FOR ELEMENTARY SCHOOL TEACHERS. University of Northern Iowa, Cedar Falls, Iowa 50613; E. Glenadine Gibb, Science Education Center, University of Texas, Austin, Tex. 78712.

a. Text material (optional) to accompany films listed below:

Foundations of Mathematics for Elementary School Teachers (Gibb, Schurrer)

b. Films available from Director of Field Services, University of Northern Iowa, Cedar Falls, Iowa 50613:

16mm, sound, black-and-white, 30 min.

What is a Number?
A System of Numeration
Operations on Whole Numbers
Techniques of Computation
Non-metric Geometry
The Fractional Numbers: Addition and Subtraction
The Fractional Numbers: Multiplication and Division
Measurement
The Integers
Problem Solving
Coordinate Systems
Real Numbers

9. PATTERNS IN ARITHMETIC. University of Wisconsin, Madison, Wis. 53706; Henry Van Engen.

A television course of instruction in arithmetic consisting of 70 15-minute lessons for pupils and ten 30-minute orientation programs for teachers for each grade, 4,5, and 6, with Dr. Van Engen, director of the project; Mary Konrad, project associate, and Marilyn Zweng, television teacher. Available on 16mm kinescopes and videotape from Station WHA-TV, University of Wisconsin.

See also: SURVEY OF RECENT EAST EUROPEAN LITERATURE IN SCHOOL AND COLLEGE MATHEMATICS, page 62.

F. Physics (includes Engineering)

1. PHYSICAL SCIENCE STUDY COMMITTEE (PSSC). Education Development Center, 55 Chapel St., Newton, Mass. 02160; Jerrold R. Zacharias, Director for Academic Affairs.

a. Raytheon Education Company, 285 Columbus Ave., Boston, Mass. 02116:

Physics (2nd ed., 1965)	
Hardback Text	$6.28
Paperback Text	
Vol. 1	2.52
Vol. 2	2.36
Vol. 3	2.36
Vol. 4	2.52
Laboratory Guide	1.76
Teachers Resource Book and Guide, 4 vols.	10.00

b. Modern Learning Aids, 1212 Avenue of the Americas, New York, N. Y. 10036:

Teachers Guide to the PSSC Films (free)

c. Educational Testing Service, Princton, N. J. 08540:

Student Achievement Tests (prices on request from Educational Testing Service)

d. Anchor Books, Doubleday & Co., Inc., 501 Franklin Ave., Garden City, N. Y. 11530:

Science Study Series,* paperback books for outside reading in fields related to the PSSC course (prices range from $1.00 to $1.50 per copy):

Rutherford and the Nature of the Atom (Andrade)
Sir Isaac Newton: His Life and Work (Andrade)
A Short History of Chemistry: An Introduction to the Ideas and Concepts of Chemistry (Asimov)
Waves and Beaches: The Dynamics of the Ocean Surface (Bascom)
The Unclean Sky: A Meteorologist Looks at Air Pollution (Battan)
The Nature of Violent Storms: Physics and the Weather (Battan)

*Planned under National Science Foundation grant and now independently published.

Science Study Series (continued):

Radar Observes the Weather: New Understanding of Cloud Physics (Battan)
Cloud Physics and Cloud Seeding: Introduction to Applied Meteorology (Battan)
Horns, Strings and Harmony: The Science of Enjoyable Sounds (Benade)
Magnets: The Education of a Physicist (Bitter)
Mathematical Aspects of Physics: An Introduction (Bitter)
The Universe at Large: Views of Cosmology (Bondi)
Relativity and Common Sense: A New Approach to Einstein (Bondi)
Soap Bubbles and the Forces Which Mould Them (Boys)
Count Rumford: Physicist Extraordinary (Brown)
The Birth of a New Physics: From Copernicus to Newton (Cohen)
Water: The Mirror of Science (Davis, Day)
Pasteur and Modern Science (Dubos)
Watching for the Wind: The Seen and Unseen Influences on Local Weather (Edinger)
Computers and the Human Mind: An Introduction to Artificial Intelligence (Fink)
The Physics of Television: Photons, Electrons, Pictures (Fink, Lutyens)
Nerves and Muscles: An Introduction to Biophysics (Galambos)
Gravity: Classic and Modern Views (Gamow)
Thirty Years That Shook Physics: The Story of Quantum Theory (Gamow)
Bird Migration: The Biology and Physics of Orientation Behavior (Griffin)
Echoes of Bats and Men: Seeing with Sound Waves (Griffin)
Crystals and Crystal Growing: Order in Nature (Holden, Singer)
The Neutron Story: Exploring the Nature of Matter (Hughes)
How Old Is the Earth? New Answers to an Ancient Riddle (Hurley)
Michelson and the Speed of Light: Biography of a Scientist (Jaffe)
Sound Waves and Light Waves: The Fundamentals of Wave Motion (Kock)
The Watershed: A Biography of Johannes Kepler (Koestler)
Faraday, Maxwell, and Kelvin (MacDonald)
Near Zero: The Physics of Low Temperature (MacDonald)
Weather on the Planets: What We Know About Their Atmospheres (Ohring)
Life in the Universe: A Scientific Discussion (Ovenden)
The Origin of Radar: An Epic of Modern Technology (Page)
Electrons and Waves: An Introduction to the Science of Electronics and Communications (Pierce)

Quantum Electronics: The Fundamentals of Transistors and Lasers (Pierce)
The Restless Atom: The Awakening of Nuclear Physics (Romer)
Heat Engines: Thermodynamics in Theory and Practice (Sandfort)
Shape and Flow: The Fluid Dynamics of Drag (Shapiro)
Perpetual Motion: Electrons and Atoms in Crystals (Stewart)
Discoverer of the Electron (Thomson, Thomson)
Waves and the Ear: What We Hear and How (van Bergeijk, Pierce, and David)
Lady Luck: The Theory of Probability (Weaver)
Knowledge and Wonder: The Natural World as Man Knows It (Weisskopf)
Accelerators: Machines of Nuclear Physics (Wilson, Littauer)

e. PSSC films available from Modern Learning Aids, 1212 Avenue of the Americas, New York, N. Y. 10036:

16mm, sound, black-and-white except as noted

Time and Clocks (28 min.), with John King, Massachusetts Institute of Technology
Long Time Intervals (25 min.), with Harrison Brown, California Institute of Technology
Short Time Intervals (21 min.), with Campbell L. Searle, Massachusetts Institute of Technology
Measuring Large Distances (29 min.), with Fletcher Watson, Harvard University
Measuring Short Distances (20 min.), with Dorothy Montgomery, Hollins College
Change of Scale (23 min.), with Robert Williams, Massachusetts Institute of Technology
Straight-Line Kinematics (34 min.), with E. M. Hafner, University of Rochester
Vectors (27 min.), with Albert V. Baez, UNESCO
Vector Kinematics (16 min.), with the late Francis L. Friedman, Massachusetts Institute of Technology
Elements, Compounds and Mixtures (color, 33 min.), with Iral Johns, Monsanto Chemical Company
Definite and Multiple Proportions (30 min.), with Robert St. George, Cambridge School, and Jerrold R. Zacharias, Massachusetts Institute of Technology
Crystals (black-and-white and color, 25 min.), with Alan Holden, Bell Telephone Laboratories
Behavior of Gases (15 min.), with Albert V. Baez, UNESCO
Random Events (31 min.), with Patterson Hume and Donald Ivey, University of Toronto
Measurement (21 min.), with William Siebert, Massachusetts Institute of Technology
Introduction to Optics (color, 23 min.), with E. P. Little, Phillips Exeter Academy

PSSC films (continued):

Pressure of Light (23 min.), with Jerrold R. Zacharias, Massachusetts Institute of Technology
Speed of Light (21 min.), with William Siebert, Massachusetts Institute of Technology
Simple Waves (27 min.), with John Shive, Bell Telephone Laboratories
Sound Waves in Air (35 min.), with Richard H. Bolt, Massachusetts Institute of Technology
Forces (23 min.), with Jerrold R. Zacharias, Massachusetts Institute of Technology
Inertia (26 min.), with E. M. Purcell, Harvard University
Inertial Mass (19 min.), with E. M. Purcell, Harvard University
Free Fall and Projectile Motion (27 min.), with Nathaniel Frank, Massachusetts Institute of Technology
Deflecting Forces (30 min.), with Nathaniel Frank, Massachusetts Institute of Technology
Periodic Motion (33 min.), with Patterson Hume and Donald Ivey, University of Toronto
Frames of Reference (28 min.), with Patterson Hume and Donald Ivey, University of Toronto
Elliptic Orbits (19 min.), with Albert V. Baez, UNESCO
Universal Gravitation (31 min.), with Patterson Hume and Donald Ivey, University of Toronto
Collision of Hard Spheres (19 min.), with James Strickland, Education Development Center
Elastic Collisions and Stored Energy (27 min.), with James Strickland, Education Development Center
Energy and Work (28 min.), with Dorothy Montgomery, Hollins College
Mechanical Energy and Thermal Energy (22 min.), with Jerrold R. Zacharias, Massachusetts Institute of Technology
Conservation of Energy (27 min.), with Arthur LaCroix, New England Electric, and Jerrold R. Zacharias, Massachusetts Institute of Technology
Coulomb's Law (30 min.), with Eric Rogers, Princeton University
Electric Fields (25 min.), with Francis Bitter, Massachusetts Institute of Technology, and John Waymouth, Sylvania Electronics Products Corporation
Electric Lines of Force (7 min.), with Alexander Joseph, Bronx Community College
Millikan Experiment (30 min.), with the late Francis L. Friedman, Massachusetts Institute of Technology, and Alfred Redfield, IBM
Coulomb Force Constant (34 min.), with Eric Rogers, Princeton University

PSSC films (continued):

Counting Electrical Charges in Motion (22 min.), with James Strickland, Education Development Center
Elementary Charges and Transfer of Kinetic Energy (34 min.), with the late Francis L. Friedman, Massachusetts Institute of Technology
E M F (20 min.), with Nathaniel Frank, Massachusetts Institute of Technology
Electrical Potential Energy and Potential Difference (Parts I and II) (54 min.), with Nathaniel Frank, Massachusetts Institute of Technology
A Magnet Laboratory (20 min.), with Francis Bitter, Massachusetts Institute of Technology, and John Waymouth, Sylvania Electronics Products Corporation
Mass of the Electron (18 min.), with Eric Rogers, Princeton University
Electrons in a Uniform Magnetic Field (10 min.), with Dorothy Montgomery, Hollins College
Rutherford Atom (40 min.), with Robert I. Hulsizer, Massachusetts Institute of Technology
Photons (19 min.), with John King, Massachusetts Institute of Technology
Interference of Photons (13 min.), with John King, Massachusetts Institute of Technology
Photo-Electric Effect (color, 28 min.), with John Strong, The Johns Hopkins University
Matter Waves (28 min.), with Alan Holden and Lester Germer, Bell Telephone Laboratories
Franck-Hertz Experiment (30 min.), with Byron Youtz, Reed College
Electromagnetic Waves (33 min.), with George Wolga, Massachusetts Institute of Technology

2. PHYSICAL SCIENCE STUDY COMMITTEE--ADVANCED TOPICS. Education Development Center, 55 Chapel St., Newton, Mass. 02160; Uri Haber-Schaim.

a. Raytheon Education Company, 285 Columbus Ave., Boston, Mass. 02116:

Advanced Topics Supplement	
Text and Laboratory Guide combined	$3.80
Teachers Guide	3.80

b. Educational Testing Service, Princeton, N. J. 08540:

Student Achievement Tests (prices on request from Educational Testing Service)

c. Films available from Modern Learning Aids, 1212 Avenue of the Americas, New York, N. Y. 10036:

16mm, sound, black-and-white

Angular Momentum: A Vector Quantity (27 min.), with Aaron Lemonick, Princeton University
The Ultimate Speed: An Exploration with High Energy Electrons (38 min.), with William Bertozzi, MIT
Time Dilation: An Experiment with mu-Mesons (36 min.), with David H. Frisch, MIT
Positron-Electron Annihilation (28 min.), with Stephen Borko, Brandeis University

3. ENGINEERING CONCEPTS CURRICULUM PROJECT (ECCP). Polytechnic Institute of Brooklyn, 333 Jay St., Brooklyn, N. Y. 11201; E. E. David, Jr., Bell Telephone Laboratories, and J. G. Truxal, Polytechnic Institute of Brooklyn.

McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York, N.Y. 10036:

The Man-Made World, text and laboratory manual (1968)
Teacher's manual available from Polytechnic Institute of Brooklyn, Fall 1968

G. Social Sciences

1. ANTHROPOLOGY CURRICULUM STUDY PROJECT, 5632 South Kimbark Ave., Chicago, Ill. 60637; Malcolm Collier, Director.

The Macmillan Company, 866 Third Ave., New York, N. Y. 10022:

Anthropology Paperbacks for Junior High School:

The Great Tree and the Longhouse: Culture of the Iroquois (Hertzberg)

Text	$2.40
Teacher's Manual	1.20

Kiowa Years: Study in Culture Impact and Profile of a People

Text (Marriott)	2.60
Teacher's Manual (Sady)	.48

Anthropology Paperback for High School:

An Annotated Bibliography of Anthropological Materials for High School Use (Gallagher), $2.44

2. SOCIAL STUDIES CURRICULUM PROGRAM. Education Development Center, 15 Mifflin Place, Cambridge, Mass. 02138; Peter B. Dow.

a. 16mm, sound, color films available for preview-loan or purchase from Film Librarian, Education Development Center, 55 Chapel St., Newton, Mass. 02160, pending commercial distribution:

Baboon Films

The Young Infant: Birth to Four Months (10 min.)
The Older Infant: Four Months to One Year (Nairobi Park) (8 min.)
The Baboon Troop (Amboseli Reserve) (20 min.)
Dynamics of Male Dominance in a Baboon Troop (Nairobi Park) (30 min.)
Evening Activity (Amboseli Reserve) (5½ min.)
Observing Baboons from a Vehicle (Amboseli) (5 min.)
Animals in Amboseli (20 min.)

Netsilik Eskimos: Fishing at the Stone Weir (2 parts) (silent, color--Part I, 29 min.; Part II, 28 min.)

Corn and the Origins of Settled Life in Meso-America (2 parts) (Part I, 19 min.; Part II, 21 min.)

Land and Water in Iraq (13 min.)

Archaeology in Mesopotamia (16 min.)

Earliest Writing (11 min.)

b. 8mm cartridge loops, color, 3-4 min. for use with Technicolor projector, available from EDC Film Library:

A Tool to Make a Tool
Digging Sticks
Chopping and Splitting
Fire Making

3. FILM SERIES: "SPADEWORK FOR HISTORY". University of Texas, Austin, Tex. 78712; E. Mott Davis, Dept. of Anthropology.

Film rentals: Film Booking Office, Visual Instruction Bureau, Division of Extension, University of Texas.
Sales: Radio/Television, University of Texas.
Television use: National Educational Television and Radio Center, New York, N. Y. 10019.

16mm, sound, color, 29 min.

Salvaging American Prehistory
The Woodlands
The Plains
The Desert
Plateau and Pacific
Salvaging Texas Prehistory

III. COLLEGE AND UNIVERSITY PROJECTS

A. Multidisciplinary

1. AMERICAN ARCHIVE OF THE ENCYCLOPAEDIA CINEMATOGRAPHICA. The Pennsylvania State University, University Park, Pa. 16802; Leslie P. Greenhill, Assistant Vice President for Resident Instruction.

   Film documents suitable for university teaching available from Audio-Visual Services, The Pennsylvania State University, University Park, Pa. 16802:

   Biological Sciences

Zoology (530 films)	-- physiology and behavior
Cytology (26 films)	-- cytology, histology
Microbiology (35 films)	-- bacteria, fungi, protozoa
Botany (17 films)	-- reproduction, seed distribution, growth

   Social Anthropology

Europe (93 films)	-- documentation of folk culture in North, Central, and West Europe
Africa (148 films)	-- cultures of North Africa, West Africa, Western Sudan, Central Sudan, Eastern Sudan, North East Africa, Equatorial Africa, East Africa, South Africa
Asia (80 films)	-- cultures of Near East, West Asia, Central Asia, South Asia, South East Asia
Arctic (1 film)	-- Greenland
Americas (83 films)	-- cultures of North America, Central America, Venezuela, Peru, Argentine, Uruguay, Brazil
Oceania (103 films)	-- cultures of Melanesia, Micronesia, Polynesia

   Technology

   Engineering, Agricultural, and Earth Sciences (54 films)

   A copy of the Encyclopaedia Index is available without charge from Dr. Greenhill at the above address.

2. COMBINED CHEMISTRY AND PHYSICS COURSE. Bryn Mawr College, Bryn Mawr, Pa. 19010; Rosalie C. Hoyt, Department of Physics.

   Edwards Bros., Ann Arbor, Mich.:

   Introduction to Chemistry and Physics, Vols. I and II (1966, 1967), $7.50

3. PHYSICAL SCIENCE FOR NONSCIENCE MAJORS. Rensselaer Polytechnic Institute, Troy, New York 12181; Lewis G. Bassett, Department of Chemistry.

John Wiley & Sons, Inc., 605 Third Avenue, New York, N. Y. 10016:

An Approach to Physical Science, 3rd Preliminary Edition in two volumes ($3.00 per vol.)

Teacher's Resource Book (in two volumes to correspond with texts); address inquiries to Dr. Lewis G. Bassett at above address

B. Anthropology

1. EDUCATIONAL RESOURCES IN ANTHROPOLOGY. University of California, Berkeley, Calif. 94720; David G. Mandelbaum, Department of Anthropology.

University of California Press, Berkeley, Calif. 94720:

The Teaching of Anthropology (Mandelbaum, Lasker, Albert)	
Hardback text (1963)	$8.50
Paperbound abridged edition (1967)	2.95
Resources for the Teaching of Anthropology (Mandelbaum, Lasker, Albert) (1963)	5.50

2. AMERICAN INDIAN FILMS. University of California, Berkeley, Calif. 94720; William Bascom, Department of Anthropology.

Available from University Extension Media Center, University of California, Berkeley, Calif. 94720:

16mm, sound, color

Basketry of the Pomo: Introductory Film (30 min.)
Basketry of the Pomo: Techniques (33 min.)
Basketry of the Pomo: Forms and Ornamentation (21 min.)
The Wooden Box: Made by Steaming and Bending (33 min.)
The Sinew-Backed Bow and Its Arrows (24 min.)
The Game of Staves (10 min.)
Acorns: Gathering, Storing, and Processing as Done by the Southwestern Pomo Indians of California (28 min.)
Buckeyes: A Food of the California Indians (13 min.)
Pine Nuts: A Food of the Paiute and Washo Indians of California and Nevada (13 min.)
Kashia Men's Dances: Southwestern Pomo Indians (40 min.)
The Totem Pole (26 min.)

American Indian Films (continued):

Obsidian Point Flaking (13 min.)
Calumet: The Pipe of Peace (23 min.)
The Beautiful Tree (22 min.)
Dream Dances of the Kashia Pomo (30 min.)

3. ARCHAEOLOGY OF THE MAIDU. University of California, Los Angeles, California 90024; James R. Sackett, Department of Anthropology.

Commercial distribution is being arranged.

16mm, sound, color, 33 min.

4-BUTTE-1: A Lesson in Archaeology

4. FILM ON ARCHEOLOGICAL FINDINGS AT LA VENTA, MEXICO. University of California, Berkeley, Calif. 94720; Robert F. Heizer, Department of Anthropology.

Available from University Extension, University of California:

16mm, sound, color, 29 min.

The Excavations at La Venta

5. VISUAL ANTHROPOLOGY--MOTION PICTURES AS APPLIED TO RESEARCH AND TEACHING. Harvard University, Cambridge, Mass. 02138; J. O. Brew, Department of Anthropology.

Films include Orange and Blue, a film about the excavation at Tikal, Guatemala, one on the famous Neolithic Bronze and Iron Age, a film on the culture of Kung Bushmen as well as material on other Bushmen groups, and Dead Birds, a film about warfare of the Dani.

6. FILMS ON NEPALESE CULTURE FOR COURSES IN ANTHROPOLOGY. University of California, Los Angeles, Calif. 90024; John T. Hitchcock, Department of Anthropology.

International Film Bureau, Inc., 332 South Michigan Ave., Chicago, Ill. 60604:

16mm, sound, color

Himalayan Shaman of Northern Nepal (15 min.)
Gurkha Country (19 min.)
Himalayan Shaman of Southern Nepal (14 min.)
Himalayan Farmer (16 min.)

7. ESKIMO ART. San Fernando Valley State College, Northridge, Calif. 91326; Edmund Carpenter, Department of Anthropology.

Film on aboriginal Eskimo art to be available in 35mm and 16mm prints. Commercial distribution is being arranged.

C. Biology

1. AN INTRODUCTION TO MODERN BIOLOGY ("THE NATURE OF LIVING THINGS"). Harvard University, Cambridge, Mass. 02138; George Wald, Department of Biology.

Addison-Wesley Publishing Co., Inc., Reading, Mass. 01867:

Twenty-Six Afternoons of Biology (Wald, Hopkins, Albershein, Dowling, Denhardt (2nd ed. 1966), $4.50

2. LABORATORY SOURCEBOOK FOR PLANT PATHOLOGY. American Phytopathological Society, Ithaca, N. Y. 14850; Arthur Kelman, Department of Plant Pathology, University of Wisconsin, Madison, Wis. 53706.

W. H. Freeman and Company, 660 Market St., San Francisco, Calif. 94104:

Sourcebook of Laboratory Exercises in Plant Pathology (Sourcebook Committee of the American Phytopathological Society) (1967), $8.50

3. FILM SERIES: THE PROMISE OF THE LIFE SCIENCES. Graduate School, U. S. Department of Agriculture, Washington, D. C. 20250; John B. Holden.

16mm, sound, black-and-white

Biological Transformation of Energy (54 min.), with A. Szent-Gyorgyi, Marine Biological Laboratory
Genetics (53 min.), with George Beadle, University of Chicago
Nutrition--The Chemistry of Life (58 min.), with Jean Mayer, Harvard University
Fine Structure and Pattern of Living Things (50 min.), with Paul Weiss, The Rockefeller University
The Organism and the Environment (57 min.), with Arthur D. Hasler, University of Wisconsin

4. PLANT SCIENCE FILM STUDIES. Iowa State University, Ames, Iowa 50010; John D. Dodd, Department of Botany and Plant Pathology.

Available from the following distributors in 8mm and Super 8mm silent cartridge, color, 3-10 min.:

The Ealing Corporation
2225 Massachusetts Ave.
Cambridge, Mass. 02140

Popular Science Publishing Company
355 Lexington Ave.
New York, N. Y. 10017

Modern Learning Aids
1212 Avenue of the Americas
New York, N. Y. 10036

Universal Education and Visual Arts
221 Park Avenue South
New York, N. Y. 10003

(Available in other formats from Film Production Unit, Iowa State University, Ames, Iowa 50010 in 16mm sound, color, reel; 8mm or Super 8mm sound or silent reel or sound cartridge, 3-10 min.)

Algal Syngamy--Isogamy in Chlamydomonas
" " --Zygote Formation in Pandorina
" " --Oogamy in Oedogonium
Gamete Transfer in the Bryophytes--The Splash Cup in a Moss
" " " " " --The Splash Platform in Marchantia
Photosynthetic Fixation of Carbon Dioxide
Oxygen Liberation by Isolated Chloroplasts--The Hill Reaction
Liberation of Zoospores in the Alga Basicladia
" " " Oedogonium
" " " Stigeoclonium
Regulation of Plant Development--Coleoptile Response in Zea
Effects of Red and Far-Red Light on Seedling Development
Isolation of Phytochrome
Photochemical Properties of Phytochrome
Effect of Red and Far-Red Light on Internode Length
Pathways of Water in Woody Plants
Pathways of Water in Herbaceous Plants
Spore Dispersal in the Fungi--Coprinus
Spore Dispersal in Equisetum
Early Development of the Shoot in Quercus
Phototropic Response in Coleoptiles
Early Development of the Root System
Pollen Tube Growth
The Flowering Stimulus
    Location of the Photoreceptor
    Translocation of the Stimulus
    Translocation Between Species
Heterothallism in Phycomyces
Pollen Release in Zea mays
Pollination in Zea mays
Wild and Mutant Types of Sordaria
Growth and Reproduction in Saprolegnia

Plant Science Film Studies (continued):

Sporangial Germination in Phytophthora infestans
Prairie Seasons
Transpiration Rates
Photosynthetic Pigments in Some Major Plant Groups
Stomatal Opening and Closing
Apical Dominance
Root Nodule Formation in Glycine max
Diatoms in a Food Web
Killing Weeds with 2.4-D
A Fresh-Water Algal Bloom
Oxygen Levels During an Algal Bloom
Electron Microscopy Series
    Preparation of Specimen Supports
    Specimen Fixation and Embedding
    Ultramicrotomy
    The Microscope

5. DEVELOPMENTAL ANATOMY FILMS. Audio-Visual Center, Indiana University, Bloomington, Ind. 47405; Clarence M. Flaten.

16mm, 8mm, sound, color or black-and-white; 35mm slides and transparencies for overhead projector

Development of the Cardio-Vascular System of the Chick: The Heart (21 min.)
Development of the Cardio-Vascular System of the Chick: The Blood Vessels (15 min.)
Extra-Embryonic Membranes (10 min.)

6. SHORT FILMS IN MICROBIOLOGY. University Extension, University of California, Berkeley, Calif. 94720; Donald M. Reynolds, Department of Bacteriology, University of California, Davis, Calif. 95916.

16mm, sound, black-and-white except as noted

The Development of Bacteriophage Plaques (1½ min.)
The Life Cycle of a Bacteriophage (1 min.)
Phagocytosis (3½ min.)
Rabies in a Human Patient (4 min.)
The Spread of Typhus (2 min.)
Cholera (color, 3 min.)
Clinical Aspects of Chicken Pox (Varicella) (color, 1½ min.)
Clinical Aspects of Tetanus (color, 2 min.)
Clinical Aspects of Leprosy (color, 4 min.)
Measles (Rubeola) in Children (color, 1½ min.)
Surgical Removal of Lesions in Pulmonary Tuberculosis (color, 2½ min.)
Pharmacological Testing of New Antibiotic Agents (color, 1½ min.)

Production of Poliomyelitis Vaccine (color, 12 min.)
The Effect of Poliomyelitis Virus on Human Epithelioid Cells (color, 5 min.)
The Life Cycle of the Malaria Parasite (animation, color, 11½ min.)
Anaphylaxis in Guinea Pigs (color, 7½ min.)
The Complement Fixation Test (animation, color, 5 min.)
The Rumen Ciliate Protozoa (8-10 min.)

7. CINEPHOTOGRAPHIC TECHNIQUES IN MORPHOLOGY. Audio-Visual Service, Student Services Building, Colorado State University, Fort Collins, Colo. 80521; R. D. Frandson.

16mm, sound, color, 15 min.; also available in 8mm color with magnetic sound:

The Major Structures of the Brain, a Method of Demonstrating

8. FILM ON PREDATOR-PREY RELATIONSHIPS. University Extension, University of California, Berkeley, Calif. 94720; Frank A. Pitelka.

16mm, sound, color, 20 min.

Polar Ecology: Predators and Prey

9. THREE EDUCATIONAL FILMS ON MYXOMYCETES. Audio-Visual Center, University of Iowa, Iowa City, Iowa 52240; T. R. Porter.

16mm, sound

Slime Molds I: Life Cycle (color or black-and-white, 30 min.)
Slime Molds II: Collection, Cultivation and Use (color, 19 min.)
Slime Molds III: Identification (color, 24 min.)

10. MODELS OF STRUCTURAL RELATIONSHIPS IN HUMAN ANATOMY. School of Medicine, Temple University, Philadelphia, Pa. 19122; John Franklin Huber, Department of Anatomy.

16mm, sound, color film available from Audio-Visual Facility of U. S. Public Health Service, Communicable Disease Center, Atlanta, Ga.; 8mm Fairchild cartridge available commercially from Modern Marketing Programs, a Division of Modern Talking Pictures Service, Inc., 1212 Avenue of the Americas, New York, N. Y. 10036:

The Mechanisms of the Intrinsic Muscles of the Larynx

11. TELEVISION COURSE ON "THE NEW BIOLOGY". N.E.T. Film Service, Audio-Visual Center, Indiana University, Bloomington, Ind. 47405; Ray Koppelman, Department of Biochemistry, University of Chicago, Chicago, Ill. 60637.

160 30-minute presentations, with Dr. Koppelman.

D. Chemistry

1. SUPPLEMENTARY TEACHING AIDS FOR INTRODUCTORY CHEMISTRY. The Johns Hopkins University, Baltimore, Md. 21218; Donald H. Andrews, Department of Chemistry (present address: Department of Chemistry, Florida Atlantic University, Boca Raton, Fla. 33432).

a. John Wiley & Sons, Inc., 605 Third Ave., New York, N. Y. 10016:

Fundamental Chemistry (Andrews, Kokes) (2nd ed., 1965), $8.50
Laboratory Manual for Fundamental Chemistry (Andrews, Kokes) (1962), $2.95

b. Available from Radiant Films, Inc., 247 West 42nd St., New York, N. Y. 10036:

Unheard Melodies (16mm, sound, color)

2. ELECTRONIC INSTRUMENTATION FOR QUANTITATIVE CHEMISTRY. (University of North Carolina, Chapel Hill, N. C. 27514; Charles N. Reilly, Department of Chemistry.

McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York, N. Y. 10036:

Experiments for Instructional Methods, Part V (Reilley, Sawyer) (1961), $6.95

3. APPARATUS FOR CHEMICAL ANALYSIS AND PREPARATION ON THE MICRO AND SEMI-MICRO SCALE. University of Connecticut, Storrs, Conn. 06268; John T. Stock, Department of Chemistry.

University Tutorial Press, Ltd., Clifton House, Euston Rd., London, N. W. 1, England:

Small Scale Inorganic Qualitative Analysis (Stock, Heath) (5th ed., 1963), 5/6d
Introduction to Organic Chemistry (Stock, Fill, Robinson) (2nd ed., 1967), 12/6d

4. YALE UNIVERSITY CHEMISTRY FILMS. Yale University, New Haven, Conn. 06520; Andrew Patterson, Jr., Department of Chemistry, and David G. Anderson, Department of Educational Motion Pictures.

Available from Association Films, Inc., 600 Madison Ave., New York, N. Y. 10017:

16mm, color

YF-202 Using a Filter (2 min.)
201 Using a Pipette (4 min.)
203 Quantitative Transfer (17 min.)
207 Laboratory Burners (9 min.)

Laboratory Techniques (combined)
204 Handling Chemicals--Solids (3 min.)
205 Handling Chemicals--Liquids (4 min.)
206 Handling Chemicals--Gases (3 min.)

236 Ion Removal by Metathesis (4 min.)
247 Metals and Non-Metals (9 min.)
237 Solubility Product (7 min.)
248 Proton Motions in Ice (5 min.)
249 Sulfur, its Physical States and Properties (9 min.)
250 Vapor Pressure (7 min.)
244 Electronegativity (4 min.)
233 Triple Point Determination (25 min.)
231 Solution of Alkali Metal in Liquid Ammonia (24 min.)
232 Solution of Alkali Metal in Liquid Ammonia (abridged) (5 min.)
208 Air Damped Analytical Balance (6 min.)
209 Single Pan Analytical Balance (6 min.)
223 The Bomb Calorimeter (9 min.)
254 Static Electricity, Induction (9 min.)
235 Patterns of Scientific Investigations (22 min.)
245 e/m Demonstration (4 min.)
224 Melting Points (Determinations and Trends) (9 min.)
255 Melting Points (Relation to Periodic Table--Summary) (3 min.)
246 Black's Observation on Heat (7 min.)

Operating Principles of Vacuum Pumps (combined)
257 Water Aspirator (1 min.)
258 Mechanical Pumps--Fore Pumps (3 min.)
Mechanical Pumps--Molecular Pumps ( )
260 Diffusion Pump--Mercury Vapor (2 min.)
261 Diffusion Pump--Oil Vapor (3 min.)
262 Cryogenic Pump (1 min.)
263 Ion Pump (4 min.)

Available in 8mm cartridges as well as 16mm:

Oxygen, Preparation of, 7 Demonstrations (combined)

YF-213 Sodium Peroxide and Water (2 min.)
214 Catalytic Decomposition of Hydrogen Peroxide (2 min.)
215 Catalytic Decomposition of Potassium Chlorate (3 min.)
216 Decomposition of Mercuric Oxide (3 min.)
217 Distillation from Liquid Air (2 min.)
218 Condensation of Air (1 min.)
219 Electrolysis of Water (3 min.)

Physical and Chemical Changes--6 Demonstrations (combined) (silent)

238 Phase Demonstration (1 min.)
239 Solution, Evaporation and Crystallization (3 min.)
240 Properties of Mixtures and Compounds (4 min.)
241 Slow Reaction (Iron and Oxygen) (2 min.)
242 Fast Reaction (Mercury and Silver Nitrate) (5 min.)
243 Very Fast Reaction (Ammonium Dichromate) (1 min.)

See also: VISUAL AIDS FOR TEACHING CHEMISTRY, page 22.

E. Engineering

1. SEMICONDUCTOR ELECTRONICS EDUCATION COMMITTEE. Education Development Center, 55 Chapel St., Newton, Mass. 02158; Campbell L. Searle.

a. Texts

John Wiley and Sons, Inc., 605 Third Ave., New York, N. Y. 10016 ($3.50 each in paper; also available in cloth):

Introduction to Semiconductor Physics (Adler, Smith, Longini)
Physical Electronics and Circuit Models of Transistors (Gray, DeWitt, Boothroyd, Gibbons)
Elementary Circuit Properties of Transistors (Searle, Boothroyd, Angelo, Gray, Pederson)
Characteristics and Limitations of Transistors (Thornton, DeWitt, Gray, Chenette)
Multistage Transistor Circuits (Thornton, Searle, Pederson, Adler, Angelo)
Digital Transistor Circuits (Harris, Gray, Searle)
Handbook of Basic Transistor Circuits and Measurements (Thornton, Linvill, Chenette, Ablin, Boothroyd, Willis, Searle)

b. Films available from Education Development Center:

16mm, sound, black-and-white

Gap Energy and Recombination Light in Germanium (37 min.), with Jacques I. Pankove, RCA Laboratories, and Richard B. Adler, Massachusetts Institute of Technology
Minority Carriers in Semiconductors (25 min.), with William Shockley, Shockley Laboratories, Clevite, Inc., and Richard Haynes, Bell Telephone Laboratories

16mm, silent, black-and-white

Diffusion, Part I and II (4 min. each), Bell Telephone Laboratories

16mm, color

Transistor Structure and Technology, with J. M. Early, Bell Telephone Laboratories, and R. D. Thornton, Massachusetts Institute of Technology

2. ENGINEERING GRAPHICS COURSE CONTENT STUDY. University of Detroit, Detroit, Mich. 48221; Paul M. Reinhard, Department of Engineering Graphics.

Bibliography with abstracts:

Graphic Solutions of Technical Problems (Heacock) (1966)

Monographs, McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York, N. Y. 10036 ($2.50 each):

Graphics in Space Flight--A Digest of New Graphic Solutions (Heacock) (1964)
Computer Graphics in Communications (Fetter) (1964)
Introductory Analog Computation with Graphic Solutions (Zulauf and Burnett) (1966)
Engineering Graphics and Numerical Control (Thornhill) (1967)
Four-Dimensional Descriptive Geometry (Lindgren and Slaby) (1968)

3. PROTOTYPE SYSTEMS LABORATORY EMPLOYING ELECTROHYDRAULIC, HYDRAULIC, AND HYDROMECHANICAL COMPONENTS. Michigan State University, East Lansing, Mich. 48823; H. E. Koenig, Department of Electrical Engineering, and State University of New York at Buffalo, Buffalo, New York 14214, and H. R. Martens, College of Engineering.

a. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York, N. Y. 10036:

Electromechanical System Theory (Koenig, Blackwell) (1964), $14.50
Analysis of Discrete Physical Systems (Koenig, Tokad, Kesavan) (1967), $13.75

b. John Wiley and Sons, Inc., 605 Third Ave., New York, N. Y. 10016:

Mechanics: Point Objects and Particles (Triffet) (1968), $14.95

c. Prentice-Hall, Inc., Englewood Cliffs, N. J 07631:

Theory of Applied Probability (Dubes) (1968), $13.50

4. THEORETICAL AND APPLIED MECHANICS CURRICULA. University of Colorado, Boulder, Colo. 80304; Harold Liebowitz (present address--School of Engineering and Applied Science, The George Washington University, Washington, D. C. 20006).

Prentice-Hall, Inc., Englewood Cliffs, N. J. 07631:

Curricula in Solid Mechanics (1961), $1.50

5. EQUIPMENT FOR ADVANCED CONTROL AND PROCESS DYNAMICS. Illinois Institute of Technology, Chicago, Ill. 60616; Bernet S. Swanson, Department of Chemical Engineering.

Blaisdell Publishing Company, 501 Madison Ave., New York, N. Y. 10022:

Electronic Analog Computer Primer (Stice and Swanson) (1965), $2.75

6. PROGRAMED INSTRUCTIONAL MATERIALS FOR ELECTRICAL ENGINEERING UNDERGRADUATE COURSES. Carnegie Institute of Technology, Pittsburgh, Pa. 15213; Everard M. Williams, Department of Electrical Engineering.

John Wiley and Sons, Inc., 605 Third Ave., New York, N. Y. 10016:

Solution of Linear Ordinary Differential Equations with Constant Coefficients (Williams), $2.95 (tentative)

7. A COMPUTER SYSTEM FOR INTRODUCTORY INSTRUCTION. Cornell University, Ithaca, N. Y. 14850; R. J. Walker and R. W. Conway, Department of Computer Science.

Office of Computer Services, Langmuir Laboratory, Cornell University, Ithaca, N. Y. 14850. Commercial distribution is planned.

CUPL Programming Manual
CUPL--An Approach to Introductory Computing Instruction
Reprint: "Tele CUPL: A Telephone Time-Sharing System"
Installation and Operating Instructions for CUPL
Taped CUPL lectures

8. DEMONSTRATION-EXPERIMENT FILMS IN FLUID MECHANICS. The National Committee for Fluid Mechanics Films and Education Development Center, 39 Chapel St., Newton, Mass. 02160; Arthur E. Bryson, Harvard University.

Available from Encyclopaedia Britannica Educational Corporation, 425 North Michigan Ave., Chicago, Ill. 60611:

a. 16mm, sound, black-and-white, except as noted

The Fluid Dynamics of Drag, Part 1: Some Curious Experiments (21 min.), with Ascher H. Shapiro, Massachusetts Institute of Technology
The Fluid Dynamics of Drag, Part 2: Fundamental Concepts (32 min.), with Ascher H. Shapiro
The Fluid Dynamics of Drag, Part 3: The Laws of Drag in Fluids of High and Low Viscosity (37 min.), with Ascher H. Shapiro
The Fluid Dynamics of Drag, Part 4: How to Reduce Drag (29 min.), with Ascher H. Shapiro
Pressure Fields and Fluid Acceleration (30 min.), with Ascher H. Shapiro
Vorticity (45 min.), with Ascher H. Shapiro
Flow Visualization (31 min.), with Stephen J. Kline, Stanford University
Rheological Behavior of Fluids (22 min.), with Hershel Markovitz, Mellon Institute
Secondary Flow (30 min.), with Edward S. Taylor, Massachusetts Institute of Technology
Surface Tension in Fluid Mechanics (color, 29 min.), with Lloyd Trefethen, Tufts University
Waves in Fluids (33 min.), with Arthur E. Bryson, Harvard University
Deformation of Continuous Media (38 min.), with John L. Lumley, Pennsylvania State University
Boundary Layer Control (25 min.), with David Hazen, Princeton University

Fluid Mechanics films (continued):

Magnetohydrodynamics (27 min.), with J. Arthur Shercliff, University of Warwick, England
Channel Flow of a Compressible Fluid (29 min.), with Donald Coles, California Institute of Technology
Low Reynolds Number Flows (32 min.), with Sir Geoffrey Taylor, Cambridge, England
Rarefied Gas Dynamics (33 min.), with Frank C. Hurlbut, University of California
Stratified Flow (26 min.), with Robert R. Long, The Johns Hopkins University
Cavitation (31 min.), with Phillip Eisenberg, Hydronautics, Inc.
Flow Instabilities (25 min.), with Erik L. Mollo-Christensen, Massachusetts Institute of Technology

b. In addition to the 16mm sound films, 98 4-minute 8mm silent film loops in cartridges are also available from Encyclopaedia Britannica Educational Corporation:

FM-1	Some Regimes of Boundary Layer Transition
2	Structure of the Turbulent Boundary Layer
3	Shear Deformation of Viscous Fluids
4	Separated Flows (Part I)
5	Separated Flows (Part II)
6	Boundary Layer Formation
7	Propagating Stall in Cascades
8	The Occurrence of Turbulence
9	Aerodynamic Heating as Shown by Temperature Sensitive Paints
10	Generation of Circulation and Life for an Airfoil
11	The Magnus Effect
12	Flow Separation and Vortex Shedding
13	The Bathtub Vortex
14a	Visualization of Vorticity with Vorticity Meter (Part I)
14b	Visualization of Vorticity with Vorticity Meter (Part II)
15	Incompressible Flow Through Area Contractions and Expansions
16	Flow from a Reservoir to a Duct
17	Flow Patterns in Venturis, Nozzles and Orifices
18	Secondary Flow in a Teacup
19	Secondary Flow in a Bend
20	The Horseshoe Vortex
21	Techniques of Visualization for Low Speed Flows, Part I
22	Techniques of Visualization for Low Speed Flows, Part II

Fluid Mechanics film loops (continued):

FM-23 Tollmien-Schlichting Waves
24 Wing-Tip Vortex
26 Tornadoes in the Laboratory and in Nature
27 Interaction of Oblique Shock with Flat Plate Boundary Layer (color)
28 Transonic Flow Past a Symmetrical Airfoil (color)
29 Occurrence of Supersonic Zones on Airfoils in Subsonic Flow
30 Shock-Boundary Layer Interaction on Transonic Airfoil
31 Instabilities in Circular Couette Flow
32 Turbulent Flow Between Concentric Rotating Cylinders
33 Stagnation Pressure
34 Coanda Effect
35 Radial Flow Between Parallel Disks
36 Venturi Passage
37 Streamline Curvature and Normal Pressure Gradient
38 Streamwise Pressure Gradient in Inviscid Flow
39 Interpretation of Flow Using Wall Tufts
43 Buoyancy Induced Waves in Rotating Fluid (color)
44 Inertia Oscillations in Rotating Fluid
45 Velocities Near an Airfoil
46 Current-Induced Instability of a Mercury Jet
47 Pathlines, Streaklines, Streamlines, and Timelines in Steady Flow
48 Pathlines, Streaklines, and Streamlines in Unsteady Flow
49 Flow Regimes in Subsonic Diffusers
50 Flow Over an Upstream Facing Step
51 Simple Supersonic Inlet
52 Supersonic Conical-Spike Inlet
54 Leading-Edge Separation Bubble in Two-Dimensional Flow (color)
55 Bow Waves in Hypersonic Flow (color)
56 Three-Dimensional Boundary-Layer Separation
57 Effect of Axial Jet on Afterbody Separation (color)
58 Effect of Jet Blowing Over Airfoil Flap
59 Leading-Edge Vortices on Delta Wing in Subsonic Flow (color)
60 Breakdown of Leading-Edge Vortices on Delta Wing in Subsonic Flow (color)
61 Ablation of Ice Models in a Water Tunnel
62 Interactions Between Oblique Shocks and Expansion Waves
63 Slot Blowing to Suppress Shock-Induced Separation
65 Wide-Angle Diffuser with Suction
66 Thin Bodies of Revolution at Incidence (color)
67 Flow Through Right-Angle Bends
68 Flow Through Ported Chambers

Fluid Mechanics film loops (continued):

FM-69 Flow Through Tee-Elbow
70 The Sink Vortex
71 Flow Near Tip of Lifting Wing (color)
72 Examples of Surface Tension (color)
73 Surface Tension and Contact Angles (color)
74 Formation of Bubbles (color)
75 Surface Tension and Curved Surfaces (color)
76 Breakup of Liquids into Drops (color)
77 Motions Caused by Composition Gradients along Liquid Surfaces (color)
78 Motions Caused by Electrical and Chemical Effects on Liquid Surfaces (color)
79 Motions Caused by Temperature Gradients along Liquid Surfaces (color)
80 Hele-Shaw Analogy to Potential Flows, Part I (color)
81 Hele-Shaw Analogy to Potential Flows, Part II (color)
82 Water Jet Instability in Electric Field
90 Supersonic Flow Past Diamond Airfoil
91 Modes of Sloshing in Tanks
92 Stages of Boundary Layer Instability and Transition
93 Supersonic Spike Inlet with Variable Geometry
97 Flow Through Fans and Propellers
98 Aerodynamic Heating and Ablation of Missile Shapes
102 Passage of a Shock Wave Through a Circular Orifice
107 Deformation in Fluids
108 Small-Amplitude Waves
109 Source Moving at Speeds Below and Above Wave Speeds
117 Subsonic Flow Patterns and Pressure Distributions for an Airfoil
118 Laminar Flow vs. Conventional Airfoils
119 Reduction of Airfoil Friction Drag by Suction
120 Some Methods for Increasing Maximum Lift of an Airfoil
122 Non-Linear Shear Stress Behavior in Steady Flows
123 Normal Stress Effects in Visco Elastic Fluids
124 Memory Effects in Visco Elastic Fluids
139 Small-Amplitude Gravity Waves
140 Flattening and Steepening of Large-Amplitude Gravity Waves
141 The Hydraulic Surge Wave
142 The Hydraulic Jump

9. FILMS ON THE MECHANICS OF FLUIDS. The University of Iowa, Iowa City, Iowa 52240; Hunter Rouse, Institute of Hydraulic Research.

Available from Audiovisual Center, Division of Extension and University Services, University of Iowa:

16mm, sound, color

Introduction to the Study of Fluid Motion (24 min.)
Fundamental Principles of Flow (23 min.)
Fluid Motion in a Gravitational Field (23 min.)
Characteristics of Laminar and Turbulent Flow (26 min.)
Form Drag, Lift, and Propulsion (24 min.)

10. MOTION PICTURES IN FLUID MECHANICS. University of Minnesota, St. Anthony Falls Hydraulic Laboratory, Minneapolis, Minn. 55414; Edward Silberman.

16mm, sound, color, 30 min.

Fluid Mechanics--The Boundary Layer

11. DEMONSTRATION-EXPERIMENT FILMS IN ELECTRICAL ENGINEERING. Education Development Center, Inc., 39 Chapel St., Newton, Mass. 02158; John G. Brainerd, Moore School of Electrical Engineering, University of Pennsylvania.

Available from Education Development Center:

16mm, sound, black-and-white, except as noted

Harmonic Phasors (7 min., silent), with William H. Huggins, The Johns Hopkins University
Movies from Computers (20 min.), with Ellis F. King, University of California at Los Angeles
Wave Velocities and the Omega-Beta Diagram (27 min.), with Theodore Van Duzer, University of California at Berkeley
F-M Response of a Resonant System to a Frequency Step (12 min.), with Donald D. Weiner, Syracuse University
Forces and Motion in Electromagnetic Fields
1. Synchronous Machines (33 min.), with Herbert H. Woodson, Massachusetts Institute of Technology
2. (The connecting film No. 2 has not been produced.)
3. Propagation, Evanescence, and Instability of Complex Waves (26 min.), with James R. Melcher, Massachusetts Institute of Technology
4. Instability, Convection and Amplification of Complex Waves (26 min.), with James R. Melcher, Massachusetts Institute of Technology

12. MECHANICS OF MATERIALS AND STRUCTURES. Virginia Polytechnic Institute, Blacksburg, Va. 24061; Robert A. Heller, Department of Engineering Mechanics.

McGraw-Hill Book Company, Inc., 330 West 42nd St., New York, N. Y. 10036:

16mm, sound, color, 16-20 min.

Loads on Structures
Behavior of Structural Materials
Tensile and Compressive Structures

13. MOISTURE MOVEMENT IN WOOD. State University College of Forestry at Syracuse University, Syracuse, N. Y. 13210; William M. Harlow and Christen Skaar, Department of Wood Products Engineering.

Available from Film Library, State University College of Forestry at Syracuse University:

16mm, sound, color, 30 min.

The Mechanism of Moisture Movement in Wood

14. APPARATUS AND EXPERIMENTS IN MAGNETOGASDYNAMICS. Department of Mechanical Engineering and Gas Dynamics Laboratory, Northwestern University, Evanston, Ill. 60201; Ali Bulent Cambel (on leave from Northwestern 1966-68 at Institute for Defense Analysis, 400 Army-Navy Drive, Arlington, Va. 22202), and Thomas P. Anderson (present address: Department of Mechanical Engineering, University of Iowa, Iowa City, Iowa 52240).

Magnetohydrodynamics (16mm, sound)
The Influence of a Magnetic Field on Mercury Surface Waves (16mm, silent)

See also: ENGINEERING CONCEPTS CURRICULUM PROJECT, page 39.

F. Mathematics

1. INTRODUCTORY COURSE ON PROBABILITY MATRICES AND CALCULUS FOR STUDENTS IN THE BIOLOGICAL AND SOCIAL SCIENCES. The University of Kansas, Lawrence, Kans. 66044; G. Baley Price, Department of Mathematics.

   Addison-Wesley Publishing Co., Inc., Reading, Mass. 01867:

   Linear Equations and Matrices (Johnston, Price, Van Vleck) (1966), $8.50
   Sets, Functions, and Probability (Johnston, Price, Van Vleck) (1968), $8.95

2. MATHEMATICS COURSES FOR PROSPECTIVE ELEMENTARY SCHOOL TEACHERS. University of Maryland, College Park, Md. 20742; John R. Mayor and Helen L. Garstens, Department of Mathematics.

   Available from College of Education, University of Maryland:

   Mathematics for Elementary School Teachers, Book I and II ($2.00 each)

3. COURSE IN THE NUMBER SYSTEM FOR ELEMENTARY SCHOOL TEACHERS. New Mexico State University, Las Cruces, N. Mex. 88001--Ralph Crouch, Department of Mathematical Sciences; and Eastern New Mexico University--George Baldwin, Department of Mathematics.

   Available from Department of Mathematics, New Mexico State University:

   An Intuitive Development of the Real Number System and Related Topics, Part I and Part II (limited supply available free)

4. FILMS AND OTHER TEACHING MATERIALS FOR COLLEGE MATHEMATICS. Mathematical Association of America; Committee on Educational Media, P. O. Box 2310, San Francisco, Calif. 94126.

   a. Available from Committee on Educational Media:

      Programed Learning and Mathematical Education (May), free

   b. W. A. Benjamin, Inc., 1 Park Ave., New York, N. Y. 10016.

      A Programed Course in Calculus
      Vol. I : Functions, Limits, and the Derivative
      Vol. II: The Definite Integral
      Vol.III: Transcendental Functions
      Vol. IV: Applications and Techniques of Integration
      Vol. V : Infinite Sequences and Series

c. Films available from Modern Learning Aids, 1212 Avenue of the Americas, New York, N. Y. 10036:

(1) Individual Lectures--16mm, sound, black-and-white, except as noted

Let Us Teach Guessing: A Demonstration with George Polya, (color, 61 min.)
Mathematical Induction: A Lecture by Leon Henkin (color, 62 min.)
Mr. Simplex Saves the Aspidistra with Frank Kocher, Leon Henkin, and Julius H. Hlavaty (color, 33 min.)
Theory of Limits (Part I--Limits of Sequences; Parts II & III--Limits of Functions and Limit Processes and The Cauchy Criterion for Convergence): Lectures by E. J. McShane (30 and 38 min.)
Topology with Raoul Bott and Marston Morse (30 min.)
Challenge in the Classroom: The Methods of R. L. Moore (color, 55 min.)
Challenging Conjectures: A Lecture by R. H. Bing (40 min.)
Differential Topology: Three Lectures by John Milnor (60 min. each)
Fixed Points: A Lecture by Solomon Lefschetz (color, 60 min.)
Gottingen and New York -- Reflections on a Life in Mathematics, Richard Courant (color, 43 min.)
The Kakeya Problem: A Lecture by A. S. Besicovitch (color, 60 min.)
Pits, Peaks, and Passes (Parts I and II--A Lecture on Critical Point Theory) by Marston Morse (color, 48 and 26 min.)
Predicting at Random: A Lecture by David Blackwell (color, 43 min.)
The Search for Solid Ground: A Panel Discussion with Mark Kac, John Kemeny, Hartley Rogers and Raymond Smullyan (62 min.)
What is an Integral? A Lecture by Edwin Hewitt (color, 61 min.)
What is Mathematics and How Do We Teach It? A Panel Discussion with Lipman Bers, Samuel Eilenberg, Andrew M. Gleason, Henry Pollak and Leo Zippin (60 min.)
Application of Group Theory in Particle Physics: A Lecture by Freeman Dyson (60 min.)
Can You Hear the Shape of a Drum? A Lecture by Mark Kac (color, 49 min.)
Can You Hear the Shape of a Drum? (Complete Version). A Lecture by Mark Kac (color, 67 min.)
The Classical Groups as a Source of Algebraic Problems: A Lecture by Charles Curtis (65 min.)
Measures and Set Theory: A Lecture by Stanislaw Ulam (47 min.)

(1) Individual Lectures (continued):

Nim and Other Oriented Graphs: A Lecture by Andrew M. Gleason (63 min.)
John von Neumann--A Documentary on His Life and Work (63 min.)
Who Killed Determinants? A Lecture by Kenneth O. May (57 min.)

(2) Calculus Films--16mm, sound, color

I Maximize (Chandler Davis), (10 min.)
A Function is a Mapping (Albert Fadell), (10 min.)
Continuity of Mappings (Albert Fadell), (10 min.)
Limit (Robert C. Fisher), (10 min.)
The Definite Integral as a Limit (Robert C. Fisher), (10 min.)
Infinite Acres (Melvin Henriksen), (10 min.)
Volume of a Solid of Revolution (George Leger), (8 min.)
Volume by Shells (George Leger), (8 min.)
What is Area? (Charles E. Rickart), (20 min.)
Area under a Curve (Charles E. Rickart), (10 min.)
The Definite Integral (Charles E. Rickart), (21 min.)
Fundamental Theorem of the Calculus (Morris Schreiber), (10 min.)
The Theorem of the Mean (Felix P. Welch), (10 min.)
Newton's Method (Herbert Wilf), (10 min.)

(3) Elementary Teacher Training (Level I)--16mm, sound, color

What is a Set? Part 1 and Part 2 (7 min. each)
One-to-One Correspondence (10 min.)
Counting (9 min.)
Sets: Union and Intersection (6 min.)
Addition and Subtraction (8 min.)
Multiplication and Division (9 min.)

5. SURVEY OF RECENT EAST EUROPEAN LITERATURE IN SCHOOL AND COLLEGE MATHEMATICS (enrichment materials for high school and college). The University of Chicago, Chicago, Ill. 60637; Alfred L. Putnam and Izaak Wirszup, Department of Mathematics.

a. D. C. Heath and Co., 285 Columbus Ave., Boston, Mass. 02116:

Topics in Mathematics ($1.95 each)

Algorithms and Automatic Computing Machines (Trakhtenbrot)
Areas and Logarithms (Markushevich)
Computation of Areas of Oriented Figures (Lopshits)
Configuration Theorems (Argunov, Skornyakov)
Equivalent and Equidecomposable Figures (Boltyankskii)

Topics in Mathematics (continued):

The Fibonacci Numbers (Vorobyov)
How to Construct Graphs (Shilov) with Simplest Maxima and Minima Problems (Natanson)
Hyperbolic Functions (Shervatov)
Induction in Geometry (Golovina, Yaglom)
Introduction to the Theory of Games (Venttsel')
The Method of Mathematical Induction (Sominskii)
Mistakes in Geometric Proofs (Dubnov)
Proof in Geometry (Fetisov)
Summation of Infinitely Small Quantities (Natanson)
What is Linear Programming? (Barsov)

b. Published by A. C. Vroman, Inc., 367 South Pasadena Ave., Pasadena, Calif. 91105, as Vol. IV of Studies in Mathematics of the School Mathematics Study Group (see item i, page 26).

Geometry (Kutuzov), $2.75

c. D. C. Heath and Co., 285 Columbus Ave., Boston, Mass. 02116:

Convex Figures and Polyhedra (Lyusternik)	$4.95
Eight Lectures on Mathematical Analysis (Khinchin)	4.95
Geometric Constructions in the Plane (Argunov, Balk)	in prep.
Geometry of the Straightedge and Geometry of the Compass (Zetel')	in prep.
Infinite Series (Markushevich)	4.95
Isoperimetry: Maximal and Minimal Properties of Geometric Figures (Kryzhanovskii)	in prep.
Multicolor Problems (Dynkin, Uspenskii)	1.75
Probability and Information (Yaglom and Yaglom)	in prep.
Problems in the Theory of Numbers (Dynkin, Uspenskii)	2.50
Random Walks (Dynkin, Uspenskii)	2.25

d. Holden-Day, Inc., 728 Montgomery St., San Francisco, Calif. 94111 ($3.95 each):

Challenging Mathematical Problems with Elementary Solutions, Vol. I: Combinatorial Analysis (Yaglom and Yaglom)
Challenging Mathematical Problems with Elementary Solutions, Vol. II: Various Branches of Mathematics (Yaglom and Yaglom)

e. Pergamon Press, Inc., 122 E. 55th St., New York, N. Y. 10022

Envelopes (Boltyanskii)	$2.25
Shortest Paths (Lyusternik)	2.75
Successive Approximation (Vilenkin)	2.25
Systems of Linear Equations (Margulis)	2.75

f. Academic Press, 111 Fifth Ave., New York, N. Y. 10003 ($2.45 each):

Geometric Transformations, Vol. 1: Euclidean and Affine Transformations (Modenov, Parkhomenko)
Geometric Transformations, Vol. 2: Projective Transformations (Modenov, Parkhomenko)

g. M.I.T. Press, Massachusetts Institute of Technology, Cambridge, Mass. 02142:

The Method of Coordinates (Gelfand, Glagoleva, Kirillov)

Hardback	$4.50 (approx.)
Paperback	1.50

6. AUTOMATA AND NETS. Case-Western Reserve University, Cleveland, Ohio 44106; Raymond J. Nelson, Department of Mathematics.

John Wiley and Sons, Inc., 605 Third Ave., New York, N. Y. 10016:

Introduction to Automata (Nelson) (1968), $12.95

7. POWER SERIES AND THE ELEMENTARY FUNCTIONS. Columbia University, New York, N. Y. 10027; Howard Levi (present address: Department of Mathematics, Hunter College, Bronx, New York 10468).

D. Van Nostrand Co., Inc., Princeton, N. J. 08540:

Polynomials, Power Series and Calculus (Levi), $6.00

8. EXPERIMENTAL UNDERGRADUATE INSTRUCTION IN COMPUTING. Dartmouth College, Hanover, N. H. 03755; John G. Kemeny, Department of Mathematics, and Thomas E. Kurtz, Kiewit Computation Center.

Dartmouth Publications, Dartmouth College, Hanover, N. H. 03755:

BASIC Manual
BASIC Programming
Teaching Supplements
Use of the Computer in a Course in Number Theory
Computer Programs of Use in Elementary Statistics
Computer Programs for Use in the Analysis of Variance
Use of the Computer in a Course in Logic
Using the Computer in the Teaching of Constructive Linear Algebra

9. COURSE IN MATHEMATICS FOR PROSPECTIVE JUNIOR HIGH SCHOOL TEACHERS. University of Washington, Seattle, Wash. 98105; J. Maurice Kingston, Department of Mathematics.

John Wiley and Sons, Inc., 605 Third Ave., New York, N. Y. 10016:

Mathematics for Teachers of the Middle Grades (1966), $6.95

G. Physics

1. BERKELEY PHYSICS COURSE AND LABORATORY. Education Development Center, 55 Chapel St., Newton, Mass. 02158; E. M. Purcell, Department of Physics, Harvard University, and A. C. Helmholz, Department of Physics, University of California, Berkeley.

McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York, N. Y. 10036:

Mechanics (Kittel, Knight, Ruderman)	$5.50
Electricity and Magnetism (Purcell)	5.50
Laboratory Physics, Parts A, B, and C	2.25 each
Statistical Physics (Reif)	5.50
Waves and Oscillations (Crawford), preliminary ed.	4.50
Quantum Physics (Wichmann), preliminary ed.	4.50

2. SCIENCE TEACHING CENTER: COLLEGE SCIENCE. Massachusetts Institute of Technology, Cambridge, Mass. 02139; Robert I. Hulsizer, Education Research Center.

W. W. Norton & Company, Inc., 55 Fifth Ave., New York, N. Y. 10003:

The MIT Introductory Physics Series

Special Relativity (French) (1968)	
Cloth bound	$2.95
Paperback	1.75

(Remainder of the series not yet available)

3. COMMISSION ON COLLEGE PHYSICS. The University of Michigan, Ann Arbor, Mich. 48104; Walter C. Michels, Editor, Momentum Books, Department of Physics, Bryn Mawr College, Bryn Mawr, Pa. 19010.

D. Van Nostrand Co., Inc., Princeton, N. J. 08540:

Momentum Books* (paperback series, $1.50-$1.95)

Elementary Particles (Frisch)
Radio Exploration of the Planetary System (Smith, Carr)
The Discovery of the Electron (Anderson)
Waves and Oscillations (Waldron)
Crystals and Light (Wood)
Temperatures Very Low and Very High (Zemansky)
Polarized Light (Shurcliff, Ballard)
Structure of Atomic Nuclei (Cook)
An Introduction to the Special Theory of Relativity (Katz)
Radioactivity and Its Measurement (Mann, Garfinkel)
Plasmas--Laboratory and Cosmic (Boley)
Infrared Radiation (Simon)
The Physics of Musical Sound (Josephs)
The Freezing of Supercooled Liquids (Knight)
Radio Exploration of the Sun (Smith)
Magnets (McKeehan)
The World of High Pressure (Stewart)
Magnetohydrodynamics (Little)
The Winds (Hidy)

4. EDUCATIONAL APPARATUS IN PHYSICS. American Association of Physics Teachers, 335 East 45th St., New York, N. Y. 10017; Fritjof E. Christensen.

Reprint volume of laboratory notes:

Novel Experiments in Physics (1964), $5.00

5. SOURCEBOOK FOR DEMONSTRATION EXPERIMENTS IN PHYSICS. Rensselaer Polytechnic Institute, Troy, N. Y. 12181; Harry F. Meiners and Robert Resnick, Department of Physics.

The Ronald Press Co., 15 East 26th St., New York, N. Y. 10010:

A Reference Source for Demonstration Experiments in Physics (2 vols.)

*Planned under a National Science Foundation grant and now independently published.

6. LABORATORY DEMONSTRATIONS AND EXPERIMENTS IN OPTICS. The Johns Hopkins University, Baltimore, Md. 21218; John Strong, Laboratory of Astrophysics and Physical Meteorology.

Johns Hopkins Press, Baltimore, Md. 21218:

321-page manual

Optics: Experiments and Demonstrations (Palmer), $4.95

7. FILMS FOR COLLEGE AND UNIVERSITY PHYSICS COURSES. Education Development Center, Inc., 39 Chapel St., Newton, Mass. 02160; James S. Strickland.

a. 19 films (16mm, sound, black-and-white except as noted) are commercially available for rental and sale from:

Modern Learning Aids
1212 Avenue of the Americas
New York, N. Y. 10036

Universal Education and Visual Arts
221 Park Avenue South
New York, N. Y. 10003

Also available in the new Technicolor sound cartridge format from National Instructional Films, 58 East Route 59, Nanuet, N. Y. 10954:

Angular Momentum, A Vector Quantity, Aaron Lemonick, Princeton University (27 min.)
Angular Momentum of Circularly Polarized Radiation, James Meyer, EDC, and Joseph Ladish, MIT (18 min.)
Laboratory High Vacuum Technique, Jan Orsula, MIT (30 min.)
Mass of Atoms, Raymond Hertz and Charles Brewer, Monsanto Research Corp. (47 min.)
Momentum of Electrons, John King, MIT (color, 10 min.)
Photo Emissions of Electrons, A. P. French, MIT (4 min.)
Field Emission of Electrons, A. P. French, MIT (4 min.)
Thermionic Emission of Electrons, A. P. French, MIT (color, 6 min.)
Reflection and Refraction, James Strickland, EDC (17 min.)
Interference and Diffraction, James Strickland, EDC (19 min.)
Barrier Penetration, James Strickland, EDC (8 min.)
Bragg Reflection, James Strickland, EDC (10 min.)
Doppler Effect and Shock Waves, James Strickland, EDC (8 min.)
Positron-Electron Annihilation, Stephen Berko, Brandeis University (28 min.)
Size of Atoms from an Atomic Beam Experiment, John King, MIT (28 min.)
Stern-Gerlach Experiment, Jerrold R. Zacharias, MIT (26 min.)
Time Dilation, David H. Frisch, MIT, and James H. Smith, University of Illinois (36 min.)

College and University Physics Films--sound, black-and-white (continued)

Ultimate Speed, William Bertozzi, MIT (38 min.)
Velocity Distribution of Atoms in a Beam, John King, MIT (16 min.)

b. 37 short silent films (black-and-white, varying from 2-4 min.) are available in many formats (16mm, regular 8mm, and super 8mm on standard reels; or regular-8 and super-8 in Technicolor loop cartridges) from the following distributors:

Canadian Laboratory Supplies, Ltd.
80 Jutland Rd.
Toronto 18, Canada

Ealing Corporation
2225 Massachusetts Ave.
Cambridge, Mass. 02140

Macalaster Scientific Corp.
186 Third Ave.
Waltham, Mass. 02154

McGraw-Hill Book Co.
330 W. 42nd St.
New York, N. Y. 10036

Modern Learning Aids
1212 Avenue of the Americas
New York, N. Y. 10036

National Instructional Films
58 East Route 59
Nanuet, N. Y. 10954

Popular Science Publishing Co., Inc.
Audio Visual Division
355 Lexington Ave.
New York, N. Y. 10017

Science Electronics
Simon & Ledge Streets
Nashua, N. H. 03060

Universal Education and Visual Arts
221 Park Ave., South
New York, N. Y. 10003

(1) Coupled Oscillator Series: Alan Holden, Bell Telephone Laboratories (color)
- Energy Transfer
- Other Oscillators
- Normal Modes

(2) Mechanics Series: Frank W. Sinden, Bell Telephone Laboratories (computer-animated)
- Newton's Law of Motion
- Fixed System of Orbiting Bodies
- Moving System of Orbiting Bodies
- Orbiting Bodies in Various Force Fields: Part I, negative power laws
- Orbiting Bodies in Various Force Fields: Part II, positive power laws

(3) Quantum Physics Series: Judah Schwartz, MIT (computer-animated)
- Scattering in One Dimension: Part I--Barriers
- Scattering in One Dimension: Part II--Square Wells
- Scattering in One Dimension: Part III--Edge Effects

(3) Quantum Physics Series (continued)

Scattering in One Dimension: Part IV--Momentum Space
Particle in a Box

(4) Ripple Tank Wave Phenomena Series: James Strickland, EDC
Reflection of Straight Waves from Straight Barriers
Reflection of Circular Waves from Various Barriers
Reflection of Waves from Concave Barriers
Refraction of Waves
Barrier Penetration by Waves
Bragg Reflection of Waves
Doppler Effect
Formation of Shock Waves
Superposition of Pulses
Interference of Waves
The Effect of Phase Differences Between Sources
Single Slit Diffraction of Waves
Multiple Slit Diffraction of Waves
Diffraction and Scattering of Waves Around Obstacles

(5) Soap Film Oscillations: Alvin Hudson, Occidental College

(6) Solder Glass Vacuum Technique Series: Jan Orsula, MIT
Preparing the Getter Header
Preparing and Baking a Solder Glass Seal
Making the Anode Structure
Preparing the Diode Header
Sealing-off the Small Header Tube
Testing for Leaks and Outgassing the Elements
Firing the Getters

(7) Vector Kinematics Series: Francis L. Friedman, MIT
The Velocity Vector
Velocity in Circular and Simple Harmonic Motion
The Acceleration Vector
The Velocity and Acceleration in Circular Motion
Velocity and Acceleration in Simple Harmonic Motion
Velocity and Acceleration in Free Fall

8. FILMS ABOUT SYMMETRY. Polytechnic Institute of Brooklyn, Brooklyn, N.Y. 11201; Judith Bregman, Department of Physics.

Contemporary Films, Inc., 267 West 25th St., New York, N. Y. 10001:

Symmetry I (animated, 16mm, sound, color, 10 min.)
Symmetry II (not yet available)

9. FILMS ON SUPERFLUIDITY AND SUPERCONDUCTIVITY. Michigan State University, East Lansing, Mich. 48823; Alfred Leitner (present address: Department of Physics, Rensselaer Polytechnic Institute, Troy, New York 12181).

Available from Instructional Media Center, Michigan State University:

16mm, sound, black-and-white

Liquid Helium II, The Superfluid
An Introduction to Superconductivity

10. SHORT FILMS IN PHYSICS. Kenyon College, Gambier, Ohio 43022; Franklin Miller, Jr., Department of Physics.

Films sold separately or in complete sets by the following distributors:

The Ealing Corporation
2225 Massachusetts Ave.
Cambridge, Mass. 02140

W. M. Welch Scientific Co.
1515 Sedgwick St.
Chicago, Ill. 60610

Cambosco Scientific Company
342 Western Ave.
Boston, Mass. 02135

Science Electronics
Simon & Ledge Streets
Nashua, N. H. 03060

Macalaster Scientific Corp.
186 Third Ave.
Waltham, Mass. 02154

Distribution Supervisor
Motion Picture Division
Ohio State University
1885 Neil Ave.
Columbus, Ohio 43210

Silent film clips, color except as noted, 3 min.

Radioactive Decay
Scintillation Spectrometry
Absorption Spectra
Ferromagnetic Domain Wall Motion
Paramagnetism of Liquid Oxygen
Critical Temperature
Single Slit
Double Slit
Revolving Power
Michelson Interferometer
Coupled Oscillators--Equal Masses
Coupled Oscillators--Unequal Masses
Measurement of "G"--The Cavendish Experiment
Inertial Forces--Translational Acceleration
Inertial Forces--Centripetal Acceleration
The Wilberforce Pendulum
Temperature Waves
Nonrecurrent Wavefronts (black-and-white)
Tacoma Narrows Bridge Collapse

11. COLOR MOTION PICTURES ILLUSTRATING SATELLITE MOTION, GRAVITATION, AND CELESTIAL MECHANICS. Rensselaer Polytechnic Institute, Troy, N. Y. 12181; Harry F. Meiners, Department of Physics.

16mm, sound, color

Satellite Orbits (20 min.)
Satellite Lifetime (24 min.)

See also: PHYSICAL SCIENCE STUDY COMMITTEE--ADVANCED TOPICS, page 38.

H. Psychology

1. FILMED TEACHING INTERVIEWS WITH OUTSTANDING CONTRIBUTORS TO THE PSYCHOLOGY OF PERSONALITY. University of Houston, Houston, Tex. 77004; Richard I. Evans, Department of Psychology.

Available from Association Instructional Films, Inc., 347 Madison Ave., New York, N. Y. 10017, a series of teaching interviews with 10 notable contributors to the psychology of personality. (Available are two approximately 30 to 50 minute films featuring each contributor -- 20 films in all):

16mm, sound, black-and-white

a. Erich Fromm
b. B. F. Skinner
c. Gordon Allport
d. Henry Murray
e. Raymond Cattell
f. Erik Erikson
g. Gardner Murphy
h. Arthur Miller
i. Ernest R. Hilgard
j. Nevitt Sanford

2. FOCUS ON BEHAVIOR. American Psychological Association, 1200 17th St., N. W., Washington, D. C. 20036; Arthur G. Brayfield.

Available from N.E.T. Film Service, Audio-Visual Center, Indiana University, Bloomington, Ind. 47405:

16mm, sound, black-and-white, 30 min.

The Conscience of a Child, with Robert Sears, Stanford University
A World to Perceive, with Herman Witkin, State University of New York Medical Center; Eleanor Gibson, Cornell University; and Richard D. Walk, The George Washington University

The Brain and Behavior, with Donald B. Lindsley and Horace W. Magoun, University of California, Los Angeles

The Chemistry of Behavior, with Roger Russell, Indiana University, and Sebastian Grossman, University of Iowa

Learning about Learning, with Howard Kendler, New York University; Tracy Kendler, Barnard College; Kenneth Spence, University of Iowa; Harry Harlow, University of Wisconsin; and B. F. Skinner, Harvard University

No Two Alike, with Lloyd Humphreys, University of Illinois, and James Gallagher, Institute of Research on Exceptional Children

The Social Animal, with Stanley Schacter, Columbia University; Leon Festinger, Stanford University; and Morton Deutsch, Bell Laboratories

The Need to Achieve, with David McClelland, Harvard University

Of Man and Machines, with Paul Fitts, University of Michigan; Julian Christiansen, Wright Air Development Center; and George Briggs, Ohio State University

Computers and Human Behavior, with Bert Green, Herbert Simon, and Allan Newell, Carnegie Institute of Technology

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